



**National Training**  
**on**  
**SEED LAW ENFORCEMENT**  
(August 21-25, 2023)

**TRAINING MANUAL**



*Organized by:*

Government of India  
Ministry of Agriculture & Farmers Welfare  
Department of Agriculture & Farmers Welfare

NATIONAL TRAINING  
ON  
SEED LAW ENFORCEMENT  
(AUGUST 21-25, 2023)

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ON  
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भारत सरकार  
राष्ट्रीय बीज अनुसंधान एवं प्रशिक्षण केन्द्र  
कृषि एवं किसान कल्याण मंत्रालय  
कृषि एवं किसान कल्याण विभाग  
जी टी रोड, कलेक्ट्री फार्म,  
पोस्ट ऑफिस इन्डस्ट्रियल इस्टेट,  
वाराणसी 221 106 (उ.प्र.)



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NATIONAL SEED RESEARCH & TRAINING  
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(U. P.)

## FOREWORD

Seed is a primary determinant of future plant development and the most vital input in agricultural production. In fact it is the most cost efficient means of increasing agricultural production and productivity. Quality seeds alone in good soil can increase agricultural production significantly.

I am happy that National Seed Research and Training Centre, Varanasi has organized a National Training Programme on "Seed Law Enforcement" during August 21-25, 2023. The objective of this training programme is to update the knowledge of all participants engaged in policy making on the issues related to Seed Law Enforcement & Seed Quality Regulation in their respective areas and to provide a forum to discuss and exchange their experience.

The training course is designed to suit the need of officials from Central/State Government Institutions, Public Sector Undertakings, Private sector and others who are engaged in Seed Law Enforcement and Seed Quality Regulation Programme and to update the knowledge of Seed Inspectors and Seed Quality Managers at field level.

This training manual comprises of all the latest information pertaining to Seed Law Enforcement and Seed Quality Regulation System in the country. I hope this compilation will serve as a useful resource book and guide to all concerned.

Date: 25 .08.2023

Place: Varanasi

  
(Manoj Kumar, IAS)  
Director

# National Training on Seed Law Enforcement (August 21 – 25, 2023)

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## NSRTC at a glance...

**National Seed Research and Training Centre (NSRTC), Varanasi** established under Govt. of India, Ministry of Agriculture & Farmers Welfare, Department of Agriculture and Farmers Welfare, during October 2005.

The prime objective of establishment NSRTC is to have a separate National Seed Quality Control Laboratory, which is serving as **Central Seed Testing Laboratory (CSTL)** as well as to act as **Referral laboratory** for hon'ble court of the entire country.

Further, this **CSTL** has to coordinate and monitor the functioning of all the **notified State Seed Testing Laboratories** presently available in our country in order to obtain Uniformity in Seed quality Regulation at National level.

More importantly for facilitating International seed Movement, our CSTL the member laboratory of International Seed Testing Association (ISTA), ZURICH, Switzerland and expected to become accredited Laboratory very soon and thereafter will be eligible for issuing International seed movement certificates on behalf of Government of India.

NSRTC is the National Centre for Training Human resources for the officials who are all involved in the **Seed Quality Control, Seed Law Enforcement and stake holders of Seed Industry**.

In order to fulfill the mandate, NSRTC organize National trainings, workshops, National seed congress for the benefit of personnel involved in seed development and quality control programme and stakeholders of seed industry for updating their knowledge and skills.

The NSRTC is situated under greater periphery of the Holy city Varanasi, which is located 7 KM away from heart of city towards south – west on Varanasi - Allahabad GT road, Collectry farm, surrounded by Banaras Hindu University (6 km), Indian Institute of Vegetable Research (20kms) and well linked by Air, Train and Road.

### PRIME OBJECTIVES:

- To have a separate National Seed Quality Control Laboratory, which is serving as **Central Seed Testing Laboratory (CSTL)**.
- To act as **Referral laboratory** for hon'ble court for the entire country w.e.f 1.4.2007 onwards.
- Member laboratory of **International Seed Testing Association (ISTA)**, Switzerland,
- Centre for testing all transgenic crop seeds etc., in future
- **To organize National and International seed related conferences, symposium and trainings** for the benefit of personnel who are involved in seed development and quality control programme and stakeholders of seed industry.
- Centre for training human resource on all seed related aspects.

### VISION:

Our vision is to

- Contribute integrated approach towards quality seed availability.
- Have separate National Seed Quality Control Laboratory as CSTL.
- Maintain uniformity in seed testing and seed quality control at National level.
- Make Seed Industry in India globally competitive.

## **MISSION:**

Our mission is to lead and engage in downstream programmes on Seed Science and Quality Control to disseminate the values of seed production and availability of quality seed to the need of National and International seed community.

## **STRATEGY:**

NSRTC pursues its Mission and Goals through

- Integrated approach and system –based programs on seed quality control and act as Referral Lab for the hon'ble Court.
- Strengthening Seed Technological Research in seed production disciplines of major crops.
- Total seed quality management through systemic seed certification and law enforcement process.
- Interaction with stake holders of seed industry, officials of seed certification and law enforcement, seed producers and other seed organizations that share's NSRTC mission.
- Continued efforts in improving / updating knowledge and skill of human resources involved in seed certification and quality control as a training human resource on all seed related aspects
- In order to meet out these vision and missions strategy the NSRTC is housed in a modern building with all latest infrastructural facilities, equipments and machineries, excellent conference/ seminar hall, workshop /class rooms, exclusive ISTA member laboratories, museum, well stocked library.

## **Staff strength:**

The Ministry of Finance sanctioned of 23 posts for National Seed Research and Training Centre, Varanasi for making the centre functional so as to meet out the mandate.



NSRTC is especially designed for continuous dissemination of knowledge of seed and thereby improve skill, competency and scientific soundness of individuals engaged in seed development programme. NSRTC regularly organizes training on various aspects of seed for



the officials working in Seed Certification Agencies (25 in number), Seed Testing Laboratory (147 in number), Seed Law Enforcement Agencies, Agricultural Universities and other institutes dealing with seeds. The NSRTC, Central Seed Testing Laboratory acts as a referral lab under clause 4(1) of the Seeds Act, 1966. CSTL, NSRTC is testing more than 20,000 samples per year and performs at par with ISTA (International Seed Testing Association) with regard to seed testing net work in the country.

### **National Seed Testing Laboratory as Central Seed Testing Laboratory**

The testing of seed material will be flowing from different State Seed Corporations as well as Seed Producing Organizations for physical purity, seed health and at later stage genetic purity that is mostly required in referral cases. At present the mandate of Central Seed Testing Laboratory (CSTL) is to receive 5% samples from seed producing organizations all over the country. In addition, CSTL act as a Nodal centre for coordinating the activities of Seed Quality Control programmes on behalf of Government of India in accordance with the Act and Rules with the State Notified Seed Testing Laboratories.


### **Grow Out Test**

NSRTC have been allotted 10 hectares of land out of which the office premises have been constructed in about 2.5 hectares of land and remaining land have been kept reserve for organizing Grow Out Test for which Green House/Poly House and other necessary facilities have been created.

### **NSRTC is geared to go Global**

NSRTC is a globally competitive Institute in Seed Science and Quality control, marching ahead with:

- To promote the availability of quality seed to meet the challenges of Science based Agriculture.
- Making of promising Technologies reach the seed entrepreneurs and other stakeholders through innovative Trainings, Conferences, Workshops and Symposia.
- Establishing uniformity in Seed production & Quality Control programmes at National level.
- Innovative curriculum planning and implementation to make Seed Science & Research more vibrant and responsible to match the vision and needs of present and future.

  
Manoj Kumar, IAS  
Director, NSRTC



# Seed Quality Control System in India

Dr. D. K. Srivastava,  
Deputy Commissioner (QC),  
Ministry of Agriculture and Farmers Welfare, DA & FW, New Delhi

The legal instruments which cover seed quality are Seeds Act, 1966, Seed Rules, 1968 and Seed (Control) Order, 1983

## **THE SEEDS ACT, 1966 & Seed Rules, 1968**

The Indian Parliament passed the Seeds Act on the 29<sup>th</sup> December 1966. The object of the Seeds Act is to regulate the quality of seeds of notified kind/varieties for sale. The Seeds Act was designed to create a "Climate" in which the seeds man could operate effectively and to make good quality seed available to the cultivators. Seed Rules under the Act were notified in September 1968 and the Act was implemented for the entire country in October 1969. Implementation of the Seeds Act and Rules are vested with State Governments. Quality regulation is to be achieved through compulsory labeling and voluntary certification of seeds of notified kind/varieties. The Seeds Act, 1966 contains 25 Sections and its salient features are given as under:

### **Power to notify the kind/varieties**

New Varieties developed by the State Agricultural Universities, ICAR and other Research Institutions are released by the sub-committees constituted under Section 3 and 3(5) of the Seeds Act, 1966 and notified under Section 5 of the Seeds Act by Central Government in consultation with the Central Seed Committee. As on date more than 4700 varieties have been notified.

### **Labeling Provision**

Minimum limits for germination, physical and genetic purity of varieties/hybrids for crops have been prescribed and notified for labeling of seeds under Section 6(a) of the Seeds Act. Size, colour and content of the label were also notified under sub clause (b) of Section 6 of Seeds Act. Colour of the label is Opeline Green and size is 15 cm. length and 10.0 cm. breadth or proportionate thereof.

Section 7 of the Act regulates the sale of notified kind or varieties. Accordingly, no person shall keep for sale, offer to sell, barter or otherwise supply any seed of any notified kind or variety, after the validity date recorded on the container or mark or label. The seed is expected to retain the germination, which is not less than that prescribed under clause (a) of Section 6 of the Seeds Act upto the validity date.

### **Seed Inspector**

The State Government, under Section 13 of the Act may appoint such person as it thinks fit, having prescribed qualification through notification, as Seed Inspector and define the area within which he shall exercise jurisdiction for enforcing the Seed Law. He will be treated as a public servant within the meaning of Section 21 of the I.P.C. (45 of 1860).

### **Duties and Powers of Seed Inspector**

Seed Inspectors appointed under Section 13 of the Seeds Act have adequate power under Section 14 of the Seeds Act to draw the sample of notified kind/varieties of seeds from the source where the seeds are being sold or in course of conveying, delivering or preparing to deliver such seed to purchaser etc. He can enter and search, with such assistance if any, as he considers necessary. Seed Inspector can seize the stock of the seed in case the seed under reference is

contravened to Act and Rules. In such circumstances, the fact of the case may be informed to Magistrate and take his order for taking custody of the stock.

Seed Inspector can issue stop sale order in case the seed in question contravene the provision of relevant Act and Rules.

### **Seed Testing**

There is a provision to set up a Central Seed Testing Laboratory and State Seed Testing Laboratory to discharge functions assigned under Section 4(1) and 4(2) of the Seeds Act. As on date, 124 Seed Testing Labs are functioning in the country and more than 6.5 lakh samples have been tested.

### **Seed Analyst**

State Government could appoint the Seed Analyst through notification in the Official Gazette under Section 12 of the Seeds Act, defining his area and his jurisdiction. Seed Analyst should possess certain minimum qualification.

### **Penalty**

If any person, contravenes any provision of the Act or any Rules, or prevents a Seed Inspector from taking sample under Seeds Act or prevents a Seed Inspector from exercising any other power conferred on him could be punished under Section 19 of the Act with a fine of five hundred rupees for the first offense. In the event of such person having been previously convicted of an offense under this Section with imprisonment for a term, which may extend to six months or with fine, which may extend to one thousand rupees, or with both.

### **SEED CERTIFICATION**

- Seed Certification is a regulated process designed to secure, maintain and make available certain prescribed levels of genetic purity, physical purity, physiological quality and health in seeds including vegetative propagating materials of varieties.
- The Seed Certification Agencies are established under section 8 of the Seeds Act.
- Varieties notified under section 5 of Seeds Act are eligible for certification.
- Source of seed is necessary for certification – known pedigree – limited generation system.
- Seed has to meet prescribed minimum seed certification standards.
- Specification for Certification Tag – Length: 15 cm., Breadth: 7.5 cm., Colour: White for foundation class & Blue (Azure Blue) for certified class.

### **RESTRICTION OF EXPORT & IMPORT OF SEEDS**

There is a provision to restrict export and import of seeds of notified kinds or varieties. The Section 17 defines as under:

“No person shall for the purpose of sowing or planting by any person (including himself) export or import or cause to be exported or imported any seed of any notified kind or variety unless.

- (a) It conforms to the minimum limits of germination and purity specified for that seed under clause (a) of Section 6 and
- (b) Its container bears in the prescribed manner the mark or label with the correct particular thereof specified for that seed under clause (b) of Section 6”.

### **Seed (Control) Order, 1983**

The Seeds Act, 1966 does not have provisions such as compulsory licensing of the seed dealers, price control, seed movement control, and submission of the information about the procurement and sale of seed. To achieve these objectives seeds were declared as an essential commodity under Essential Commodities Act, 1955 and the Seed (Control) Order was issued in 1983.

### **Seed Controller**

Joint Secretary (Seeds), Government of India, Ministry of Agriculture, Department of Agriculture & Cooperation has been appointed as Seed Controller for implementation of the Seeds (Control) Order, 1983.

### **Issue of License to Dealers**

All persons carrying on the business of selling, exporting and importing Seeds will be required to carry on the business in accordance with terms and conditions of License granted to him.

Based on such enquiry, as it thinks fit the licensing authority may grant or refuse the license as per the provisions of the Seeds (Control) Order, 1983. The refusal to grant license should be accompanied by a clear recording of reasons for such refusal.

### **Renewal of License**

A holder of License shall be eligible for renewal of License.

### **Appointment of Licensing Authority**

- (i) The State Government may appoint such number of persons as it thinks necessary to be Licensing Authority and define the area within which such licensing authority shall exercise their jurisdiction.
- (ii) The State Government may appoint such number of persons, as it thinks necessary to be Inspector and define the areas of such Inspector's jurisdiction.
- (iii) Seed Inspectors notified under clause 12 of the Seeds (Control) Order, 1983 are eligible to draw any samples of seeds meant for sale or export/import etc. and to ensure that the sample confirm to the standard of quality claimed by the seed dealer under clause 13 of the Order.
- (iv) Seed Inspectors have sufficient provisions for seizure of the seeds and materials on account of violation.
- (v) Every person if so required by an Inspector shall bound to offer necessary facilities to him for the purpose of enabling him to exercise his power under this Order.

### **Time limit of analysis of samples by Seed Testing Lab**

The Seed Testing Lab to which the sample is sent by the Inspector for analysis shall analyse the seed sample and send the analysis report to the concerned Inspector within 60 days.

### **Suspension/Cancellation of License**

The Licensing Authority may after giving an opportunity of being heard to the holder of License suspends or cancel the License on grounds of mis-representation of a material particular or contravention in provision of the order.

### **Appeal**

- (i) The State Government may specify authority for hearing the appeals against suspension/cancellation under this order and the decision of such authority shall be final.

(ii) Any person aggrieved by an order of refusal to grant or amend or renew the License for sale, export/import of seed may within 60 days from the date of Order appeal to the designated authority in the manner prescribed in the Order.

### **Seed Quality Regulation for GM Crops**

Seeds quality of GM Crops is regulated under Seeds Act, 1966, Seed (Control) Order, 1983 and Environment Protection Act, 1986.

- Seed Inspector notified under Seeds Act has also power under EPA, 1986 to draw sample of seeds of GM Crops for regulation of their quality.
- STLs have also been notified to test quality of Bt. Cotton seed.
- Seed testing laboratory of CICR Nagpur has been notified as CSTL for testing seeds of Bt. Cotton.

\*\*\*\*\*

## Introduction to Seed Act 1966

Nakul Gupta, Shivam Kumar Rai and Chendra Sekher  
*ICAR-Indian Institute of Vegetable Research, Varanasi 221305, U.P.*

### Introduction

The Act was approved by the President on December 29 and was published on December 30, 1966, in issue No. 66 of Part II, Section 1 of the Extraordinary Gazette of India. To give farmers access to high-quality seeds and to provide a legislative framework for seed certification, the Seeds Act of 1966 was created. This act resulted in the creation and notification of seed rules in 1968 and the beginning of systematic seed certification in India in 1969. This law authorized the creation of a Central Seed Committee to counsel the states on issues pertaining to seeds. Additionally, seed certification agencies, seed certification boards, and state seed testing laboratories were to be established.

### Object and Reasons

It is thought that regulating the quality of specific seeds, such as seeds of food crops, cotton, jute, etc., to be sold for agricultural use, would boost agricultural production in the nation (including horticulture)

### Method to Achieve This Object:

- Establishing a central seed committee with members from the federal and state governments, the National Seeds Corporation, and other stakeholders to advise the governments on all issues relating to the law under consideration.
- Establishing minimum requirements for germination, physical purity, varietal purity, and maximum requirements for moisture, ODV, and other quality elements.
- The central government and state governments will create seed testing laboratories to examine seeds for quality attributes.
- Each state should establish a service for seed certification and inspection, and dealers in seeds should have Licenses and certifications.
- Limiting the export, import, and interstate movement of non-descriptive seed and requiring seed containers to bear labels describing the quality of seeds offered for sale.
- The Act's drafting contains provisions designed to prevent excessive hardship, such as allowing the sale of seed by:
  - a. Plant Breeder
  - b. Certain classes of producers
  - c. Any other person for purpose other than for the purpose of sowing or planting.

25 sections make up the Seeds Act of 1966's basic structure, which can be largely divided into the following three categories:

- General Sections.
- Sanctioning legislation.
- Regulating legislation.



## **The Seeds Act, 1966**

Enacted by Parliament for the whole of India to regulate seeds.

### **(1) Short title, extent and commencement**

- This Act may be called the Seeds Act, 1966.
- It extends to the whole of India.
- It will go into effect on the day that the Central Government designates by publishing a notice in the Official Gazette. Different dates may be set for various provisions of this Act, as well as for various States or regions thereof.

### **(2) Definitions**

1. "Agriculture" includes horticulture;
2. "Central Seed Laboratory" means the Central Seed Laboratory established or declared as such under sub-section (1) of section 4;
3. "Certification agency" means the certification agency established
4. "Committee" means the Central Seed Committee constituted under sub-section (1) of Section 3;
5. "Container" means a box, bottle, casket, tin, barrel, case, receptacle, sack, bag, wrapper or other thing in which any article or thing is placed or packed;
6. "Export" means taking out of India to a place outside India;
7. "Import" means bringing into India from a place outside India;
8. "Kind" means one or more related species or sub-species of crop plants each individually or collectively known by one common name such as cabbage, maize, paddy and wheat;
9. "Notified kind or variety", in relation to any seed, means any kind or variety thereof notified under Section 5;
10. "Prescribed" means prescribed by rules made under this act;
11. "Seed" means any of the following classes of seeds used for sowing or planting-
  - Seeds of food crops including edible oil seeds and seeds of fruits and vegetables;
  - Cotton seeds;
  - Seeds of cattle fodder; and includes seedlings, and tubers, bulbs, rhizomes, roots, cuttings, all types of grafts and other vegetative propagated material, of food crops or cattle fodder;
12. "Seed Analyst" means a Seed Analyst appointed under section 12;
13. "Seed Inspector" means a Seed Inspector appointed under section 13;
14. "State Government", in relation to a Union territory, means the administrator thereof;
15. "State Seed Laboratory", in relation to any State, means the State Seed Laboratory established or declared as such under sub-section (2) of section 4 for that State; and
16. "Variety" means a sub-division of a kind identifiable by growth, yield, plant, fruit, seed, or other characteristic.

### **(3) Central Seed Committee**

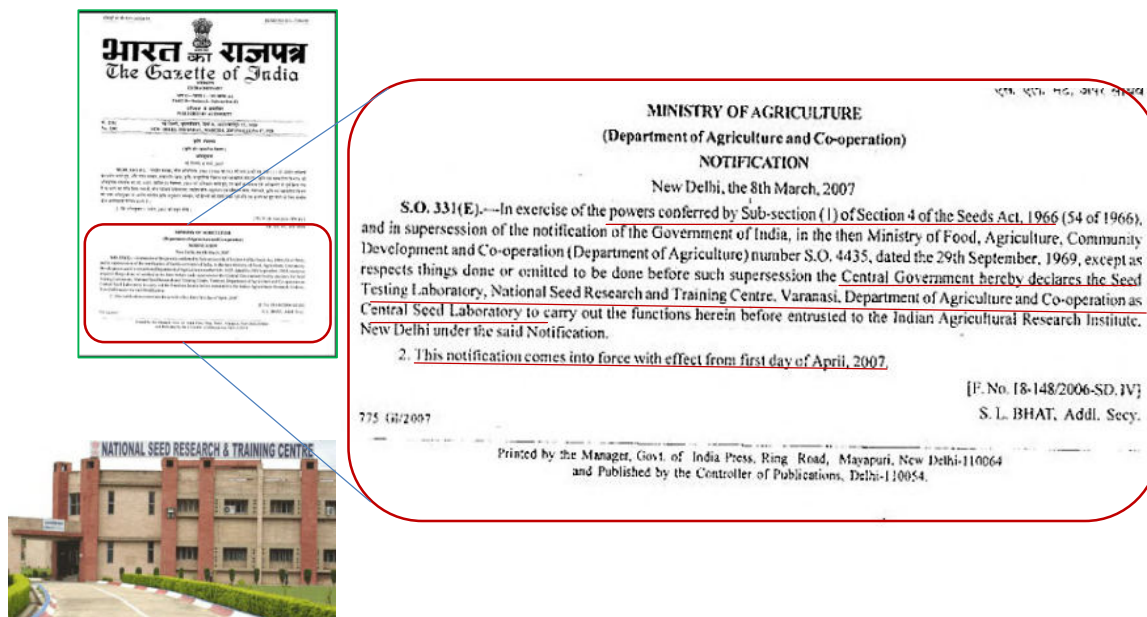
To advise the Central Government and the State Governments on matters arising out of the administration of this Act and to carry out the other functions assigned to it by or under this Act.

One chairman, eight members—two of whom are seed growers—and a member who will be proposed by the governments of each state make up the committee. The Central Government has nominated everyone. The members of the Committee are authorised to hold office for two

years and are eligible for re-nomination unless their positions become vacant earlier due to resignation, death, or other circumstances. The Committee may establish its own operating procedures with the consent of the Central Government. For the committee to operate effectively, it could form a subcommittee. If necessary, the central government will select a secretary to serve as the office's secretary.

#### (4) Central Seed Laboratory and State Seed Laboratory

- The Central Government may, by notification in the Official Gazette, establish a Central Seed Laboratory or declare any seed laboratory as the Central Seed Laboratory to carry out the functions entrusted to the Central Seed Laboratory by or under this Act.
- The State Government may, by notification in the Official Gazette, establish one or more State Seed Laboratories or declare any seed laboratory as a State Seed Laboratory where analysis of seeds of any notified kind or variety shall be carried out by Seed Analysts under this Act in the prescribed manner.



#### Power to notify kinds or varieties of seeds

If the Central Government, after consultation with the Committee, is of opinion that it is necessary or expedient to regulate the quality of seed of any kind or variety to be sold for purposes of agriculture, it may, by notification in the Official Gazette, declare such kind or variety to be a notified kind or variety for the purposes of this Act and different kinds or varieties may be notified for different States or for different areas thereof.

Seed Division : Gazette Notifications

Select Year of Notification

2017	2016	2015	2014	2013	2012
2011	2010	2009	2008	2007	2006
2005	2004	2003	2002	2001	2000
1999	1998	1997	1996	1995	1994
1993	1992	1991	1990	1989	1988
1987	1986	1985	1984	1983	1982
1981	1980	1979	1978	1977	1976
1975	1974	1973	1972	1971	1970
1969	1968	1967	1966	1965	1964
1963	1962	1961	1960	1959	1958
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1945	1944	1943	1942	1941	1940
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1885	1884	1883	1882	1881	1880
1879	1878	1877	1876	1875	1874
1873	1872	1871	1870	1869	1868
1867	1866	1865	1864	1863	1862
1861	1860	1859	1858	1857	1856
1855	1854	1853	1852	1851	1850
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1723	1722	1721	1720	1719	1718
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1603	1602	1601	1600	1599	1598
1597	1596	1595	1594	1593	1592
1591	1590	1589	1588	1587	1586
1585	1584	1583	1582	1581	1580
1579	1578	1577	1576	1575	1574
1573	1572	1571	1570	1569	1568
1567	1566	1565	1564	1563	1562
1561	1560	1559	1558	1557	1556
1555	1554	1553	1552	1551	1550
1549	1548	1547	1546	1545	1544
1543	1542	1541	1540	1539	1538
1537	1536	1535	1534	1533	1532
1531	1530	1529	1528	1527	1526
1525	1524	1523	1522	1521	1520
1519	1518	1517	1516	1515	1514
1513	1512	1511	1510	1509	1508
1507	1506	1505	1504	1503	1502
1501	1500	1499	1498	1497	1496
1495	1494	1493	1492	1491	1490
1489	1488	1487	1486	1485	1484
1483	1482	1481	1480	1479	1478
1477	1476	1475	1474	1473	1472
1471	1470	1469	1468	1467	1466
1465	1464	1463	1462	1461	1460
1459	1458	1457	1456	1455	1454
1453	1452	1451	1450	1449	1448
1447	1446	1445	1444	1443	1442
1441	1440	1439	1438	1437	1436
1435	1434	1433	1432	1431	1430
1429	1428	1427	1426	1425	1424
1423	1422	1421	1420	1419	1418
1417	1416	1415	1414	1413	1412
1411	1410	1409	1408	1407	1406
1405	1404	1403	1402	1401	1400
1399	1398	1397	1396	1395	1394
1393	1392	1391	1390	1389	1388
1387	1386	1385	1384	1383	1382
1381	1380	1379	1378	1377	1376
1375	1374	1373	1372	1371	1370
1369	1368	1367	1366	1365	1364
1363	1362	1361	1360	1359	1358
1357	1356	1355	1354	1353	1352
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1339	1338	1337	1336	1335	1334
1333	1332	1331	1330	1329	1328
1327	1326	1325	1324	1323	1322
1321	1320	1319	1318	1317	1316
1315	1314	1313	1312	1311	1310
1309	1308	1307	1306	1305	1304
1303	1302	1301	1300	1299	1298
1297	1296	1295	1294	1293	1292
1291	1290	1289	1288	1287	1286
1285	1284	1283	1282	1281	1280
1279	1278	1277	1276	1275	1274
1273	1272	1271	1270	1269	1268
1267	1266	1265	1264	1263	1262
1261	1260	1259	1258	1257	1256
1255	1254	1253	1252	1251	1250
1249	1248	1247	1246	1245	1244
1243	1242	1241	1240	1239	1238
1237	1236	1235	1234	1233	1232
1231	1230	1229	1228	1227	1226
1225	1224	1223	1222	1221	1220
1219	1218	1217	1216	1215	1214
1213	1212	1211	1210	1209	1208
1207	1206	1205	1204	1203	1202
1201	1200	1199	1198	1197	1196
1195	1194	1193	1192	1191	1190
1189	1188	1187	1186	1185	1184
1183	1182	1181	1180	1179	1178
1177	1176	1175	1174	1173	1172
1171	1170	1169	1168	1167	1166
1165	1164	1163	1162	1161	1160
1159	1158	1157	1156	1155	1154
1153	1152	1151	1150	1149	1148
1147	1146	1145	1144	1143	1142
1141	1140	1139	1138	1137	1136
1135	1134	1133	1132	1131	1130
1129	1128	1127	1126	1125	1124
1123	1122	1121	1120	1119	1118
1117	1116	1115	1114	1113	1112
1111	1110	1109	1108	1107	1106
1105	1104	1103	1102	1101	1100
1099	1098	1097	1096	1095	1094
1093	1092	1091	1090	1089	1088
1087	1086	1085	1084	1083	1082
1081	1080	1079	1078	1077	1076
1075	1074	1073	1072	1071	1070
1069	1068	1067	1066	1065	1064
1063	1062	1061	1060	1059	1058
1057	1056	1055	1054	1053	1052
1051	1050	1049	1048	1047	1046
1045	1044	1043	1042	1041	1040
1039	1038	1037	1036	1035	1034
1033	1032	1031	1030	1029	1028
1027	1026	1025	1024	1023	1022
1021	1020	1019	1018	1017	1016
1015	1014	1013	1012	1011	1010
1009	1008	1007	1006	1005	1004
1003	1002	1001	1000	999	998
997	996	995	994	993	992
991	990	989	988	987	986
985	984	983	982	981	980
979	978	977	976	975	974
973	972	971	970	969	968
967	966	965	964	963	962
961	960	959	958	957	956
955	954	953	952	951	950
949	948	947	946	945	944
943	942	941	940	939	938
937	936	935	934	933	932
931	930	929	928	927	926
925	924	923	922	921	920
919	918	917	916	915	914
913	912	911	910	909	908
907	906	905	904	903	902
901	900	899	898	897	896
895	894	893	892	891	890
889	888	887	886	885	884
883	882	881	880	879	878
877	876	875	874	873	872
871	870	869	868	867	866
865	864	863	862	861	860
859	858	857	856	855	854
853	852	851	850	849	848
847	846	845	844	843	842
841	840	839	838	837	836
835	834	833	832	831	830
829	828	827	826	825	824
823	822	821	820	819	818
817	816	815	814	813	812
811	810	809	808	807	806
805	804	803	802	801	800
799	798	797	796	795	794
793	792	791	790	789	788
787	786	785	784	783	782
781	780	779	778	777	776
775	774	773	772	771	770
769	768	767	766	765	764
763	762	761	760	759	758
757	756	75			

### **(8) Grant of certificate by certification agency**

- Any person selling, keeping for sale, offering to sell, bartering or otherwise supplying any seed of any notified kind or variety may, if he desires to have such seed certified by the certification agency, apply to the certification agency for the grant of a certificate for the purpose.
- Every application under sub-section (1) shall be made in such form, shall contain such particulars and shall be accompanied by such fees as may be prescribed.
- On receipt of any such application for the grant of a certificate, the certification agency may, after such enquiry as it thinks fit and after satisfying itself that the seed to which the application relates conforms to the 1[prescribed standards], grant a certificate in such form and on such conditions as may be prescribed:
- Provided that such standards shall not be lower than the minimum limits of germination and purity specified for that seed under clause (a) of section 6.

### **(9) Revocation of certificate**

If the certification agency is satisfied, either on a reference made to it in this behalf or otherwise, that—

- The certificate granted by it under section 9 has been obtained by misrepresentation as to an essential fact; or
- The holder of the certificate has, without reasonable cause, failed to comply with the conditions subject to which the certificate has been granted or has contravened any of the provisions of this Act or the rules made there under, then, without prejudice to any other penalty to which the holder of the certificate may be liable under this Act, the certification agency may, after giving the holder of the certificate an opportunity of showing cause, revoke the certificate.

### **(10) Appeal**

- Any person aggrieved by a decision of a certification agency under section 9 or section 10, may within thirty days from the date on which the decision is communicated to him and on payment of such fees as may be prescribed, prefer an appeal to such authority as may be specified by the State Government in this behalf
- On receipt of an appeal under sub-section (1), the appellate authority shall, after giving the appellante an opportunity of being heard, dispose of the appeal as expeditiously as possible.
- Every order of the appellate authority under this section shall be final.

### **(11) Seed Analysts**

The State Government may, by notification in the Official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications, to be Seed Analysts and define the areas within which they shall exercise jurisdiction.

### **(12) Seed Inspectors**

- The State Government may, by notification in the Official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications, to be Seed Inspectors and define the areas within which they shall exercise jurisdiction.

- Every Seed Inspector shall be deemed to be a public servant within the meaning of section 21 of the Indian Penal Code (45 of 1860) and shall be officially subordinate to such authority as the State Government may specify in this behalf.

### **(13) Powers of Seed Inspector**

- The Seed Inspector may –
  - take samples of any seed in any notified kind or variety from –
    - any person selling such seed; or
    - any person who is in the course of conveying, delivering or preparing to deliver such seed to a purchaser or a consignee; or
    - a purchaser or a consignee after delivery of such seed to him;
  - send such sample for analysis to the Seed Analyst for the area within which such sample has been taken;
  - enter and search at all reasonable times, with such assistance, if any, as he considers necessary, any place in which he has reason to believe that an offence under this Act has been or is being committed and order in writing the person in possession of any seed in respect of which the offence has been or is being committed, not to dispose of any stock of such seed for a specific period not exceeding thirty days or, unless the alleged offence is such that the defect may be removed by the possessor of the seed, seize the stock of such seed;
  - Examine any record, register, document or any other material object found in any place mentioned in clause (c) and seize the same if he has reason to believe that it may furnish evidence of the commission of an offence punishable under this Act;
  - Exercise such other powers as may be necessary for carrying out the purposes of this Act or any rule made there under.
- Where any sample of any seed of any notified kind or variety is taken under clause (a) of sub-section (1), its cost, calculated at the rate at which such seed is usually sold to the public, shall be paid on demand to the person from whom it is taken
- The power conferred by this section includes power to break-open any container in which any seed of any notified kind or variety may be contained or to break-open the door of any premises where any such seed may be kept for sale: Provided that the power to break-open the door shall be exercised only after the owner or any other person in occupation of the premises, if he is present therein, refuses to open the door on being called upon to do so.
- Where the Seed Inspector takes any action under clause (a) of sub-section (1), he shall, as far as possible, call not less than two persons to be present at the time when such action is taken and take their signatures on a memorandum to be prepared in the prescribed form and manner.
- The provisions of the Code of Criminal Procedure, 1898 (5 of 1898), shall, so far as may be, apply to any search or seizure under this section as they apply to any search or seizure made under the authority of a warrant issued under section 98 of the said Code

### **(14) Procedure to be followed by Seed Inspectors**

1. Whenever a Seed Inspector intends to take sample of any seed of any notified kind or variety or analysis, he shall –



- Give notice in writing, then and there, of such intention to the person from whom he intends to take sample;
  - Except in special cases provided by rules made under this Act, take three representative samples in the prescribed manner and mark and seal or fasten up each sample in such manner as its nature permits.
2. When samples of any seed of any notified kind or variety are taken under sub-section (1), the Seed Inspector shall—
- deliver one sample to the person from whom it has been taken;
  - Rend in the prescribed manner another sample for analysis to the Seed Analyst for the area within which such sample has been taken; and
  - Retain the remaining sample in the prescribed manner for production in case any legal proceedings are taken or for analysis by the Central Seed Laboratory under sub-section (2) of section 16, as the case may be.
3. If the person from whom the samples have been taken refuses to accept one of the samples, the Seed Inspector shall send intimation to the Seed Analyst of such refusal and thereupon the Seed Analyst receiving the sample for analysis shall divide it into two parts and shall seal or fasten up one of those parts and shall cause it, either upon receipt of the sample or when he delivers his report, to be delivered to the Seed Inspector who shall retain it for production in case legal proceedings are taken.
4. Where a Seed Inspector takes any action under clause (c) of sub-section (1) of section 14,—
- He shall use all dispatch in ascertaining whether or not the seed contravenes any of the provisions of section 7 and if it is ascertained that the seed does not so contravene, forthwith revoke the order passed under the said clause or, as the case may be, take such action as may be necessary for the return of the stock of the seed seized;
  - If he seizes the stock of the seed, he shall, as soon as may be, inform a magistrate and take his orders as to the custody thereof;
  - Without prejudice to the institution of any prosecution, if the alleged offence is such that the defect may be removed by the possessor of the seed, he shall, on being satisfied that the defect has been so removed, forthwith revoke the order passed under the said clause.
5. Where a Seed Inspector seizes any record, register, document or any other material object under clause (d) of sub-section (1) of section 14, he shall, as soon as may be, inform a magistrate and take his orders as to the custody thereof.

#### **(15) Report of Seed Analyst**

1. The Seed Analyst shall, as soon as may be after the receipt of the sample under sub-section (2) of section 15, analyse the sample at the State Seed Laboratory and deliver, in such form as may be prescribed, one copy of the report of the result of the analysis to the Seed Inspector and another copy thereof to the person from whom the sample has been taken.
2. After the institution of a prosecution under this Act, the accused vendor or the complainant may, on payment of the prescribed fee, make an application to the court for sending any of the samples mentioned in clause (a) or clause (c) of sub-section (2) of section 15 to the Central Seed Laboratory for its report and on receipt of the application, the court shall first ascertain that the mark and the seal or fastening as provided in clause (b) of sub-section (1) of section 15 are

intact and may then dispatch the sample under its own seal to the Central Seed Laboratory which shall thereupon send its report to the court in the prescribed form within one month from the date of receipt of the sample, specifying the result of the analysis.

3. The report sent by the Central Seed Laboratory under sub-section (2) shall supersede the report given by the Seed Analyst under sub-section (1)
4. Where the report sent by the Central Seed Laboratory under sub-section (2) is produced in any proceedings under section 19, it shall not be necessary in such proceedings to produce any sample or part thereof taken for analysis.

#### **(16) Restriction on export and import of seeds of notified kinds or varieties**

No person shall, for the purpose of showing or planting by any person (including himself), export or import or cause to be exported or imported any seed of any notified kind or variety, unless –

- It conforms to the minimum limits of germination and purity specified for that seed under clause (a) of section 6;
- Its container bears, in the prescribed manner, the mark or label with the correct particulars thereof specified for that seed under clause (b) of section 6.

#### **(17) Recognition of seed certification agencies of foreign countries**

The Central Government may, on the recommendation of the Committee and by notification in the Official Gazette, recognize any seed certification agency established in any foreign country, for the purposes of this Act.

#### **(18) Penalty**

If any person – (a) contravenes any provision of this Act or any rule made there under; or (b) prevents a Seed Inspector from taking sample under this Act; or (c) prevents a Seed Inspector from exercising any other power conferred on him by or under this Act, he shall, on conviction, be punishable – (i) for the first offence with fine which may extend to five hundred rupees, and (ii) in the event of such person having been previously convicted of an offence under this section, with imprisonment for a term which may extend to six months, or with fine which may extend to one thousand rupees, or with both.

#### **(19) Forfeiture of property**

When any person has been convicted under this Act for the contravention of any of the provisions of this Act or the rules made there under, the seed in respect of which the contravention has been committed may be forfeited to the Government

#### **(20) Offences by companies**

1. Where an offence under this Act has been committed by a company, every person who at the time the offence was committed was in charge of, and was responsible to, the company for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly: Provided that nothing contained in this sub-section shall render any such person liable to any punishment

under this Act if he proves that the offence was committed without his knowledge and that he exercised all due diligence to prevent the commission of such offence

2. Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Explanation—For the purposes of this section,— (a) “company” means anybody corporate and includes a firm or other association of individuals; and (b) “director”, in relation to a firm, means a partner in the firm.

#### **(21) Protection of action taken in good faith**

Not suit, prosecution or other legal proceeding shall lie against the Government or any officer of the Government for anything which is in good faith done or intended to be done under this Act.

#### **(22) Power to give directions**

The Central Government may give such directions to any State Government as may appear to the Central Government to be necessary for carrying into execution in the State any of the provisions of this Act or of any rule made there under.

#### **(23) Exemption**

Nothing in this Act shall apply to any seed of any notified kind or variety grown by a person and sold or delivered by him on his own premises direct to another person for being used by that person for the purpose of sowing or planting.

#### **(24) Power to make rules**

1. The Central Government may, by notification in the Official Gazette, make rules to carry out the purposes of this Act.
2. In particular and without prejudice to the generality of the foregoing power.

#### **Lacunae in Seed Act 1966**

- The farmers' traditional seed system is left outside the Act.
- Seed marketing is linked neither to plant breeders' rights nor to any established ownership on variety.
- Not prescribe the declaration of pedigree, particularly in the case of TLVs, secrecy on pedigree is used to create a commercial monopoly on seeds.
- In the seed chain involving producers, processors and stockiest/traders, license for the transaction is required only for the stockiest/trader.
- The enforcement of the law is weak and the prescribed penalty is soft.
- Excludes horticultural nurseries.

## Seeds Bill 2011 and Seeds Act 1966 -A Comparison (CUTS, 2015)

The Seeds Act of 1966 and the significant amendments proposed should be taken into account while analyzing the Seeds Bill of 2004 and how it came to be in its current form. Several adjustments are suggested. A few significant ones are export and import restrictions, farmer compensation, transgenic varieties, registration, and penalties. These appear to be consistent with shifting domestic and global dynamics, where the private sector's position has significantly changed. The broad suggested amendments are summarized below and show how the Seeds Act of 1966 compares to the Bill's proposed revisions. The Bill is aware of the shifting dynamics of seeds both domestically and internationally. It suggests a thorough makeover, starting with a broader definition of agriculture, followed by farmer compensation and penalties for seed providers and producers of inferior quality.

Particular	Seeds Bill 2011	Seeds Act 1966
<b>Definitions</b>	Agriculture includes horticulture, forestry, and cultivation of medicinal and aromatic plants	Agriculture includes horticulture
	Definitions of Seed and Variety have been changed to make them more specific and technical	
	Defines the terms Dealer, Essentially Derived Variety, Extant Variety, Farmer, Horticulture Nursery, Misbranded, Spurious Seed, and Transgenic Variety	Does not define these terms
<b>Registration</b>	All seeds for sale must be registered	Only the varieties notified by the Government need to be registered
<b>Seed Committee</b>	Constitutes Central and State Seed Committees. A Registration Sub-committee would register seeds of all varieties	Constitutes CSC. The Central Government, after consulting with the CSC, may notify a seed in order to regulate the quality of seed
<b>Transgenic Varieties</b>	Includes special provisions for registration of transgenic varieties of seeds	No provision for transgenic varieties of seeds
<b>Compensation to Farmers</b>	Provides for compensation to the farmers through specially constituted Compensation Committee	No specific provision for compensation mentioned in the Act
<b>Export and Import</b>	All seed imports are regulated by the Plant Quarantine (Regulation of Import into India) Order, 2003 or any corresponding order of the Destructive Insects and Pests Act, 1914; shall conform to the minimum limits of germination etc. Exports can be restricted if they adversely affect the food security of the	A person is restricted from exporting or importing notified variety of seeds unless it conforms to minimum limits of germination etc

	country	
<b>Penalties</b>	Any person who contravenes any provisions of the Act or imports, sells or stocks seeds deemed to be misbranded or not registered, can be punishable by a fine of Rs. 5,000 to Rs. 30,000. The penalty for giving false information might lead to prison term up to six months and/or a fine up to Rs.100,000	Any person, who contravenes any provisions of the Act, prevents a Seed Inspector from taking samples etc. shall be punished for the first offence with a fine, which may extend to Rs.500. If the offence is repeated he may be imprisoned for a maximum term of six-months and/or fined up to Rs.1,000

### References

- Santhy, V., P.R. Vijaya Kumari, AnshuVishwanathan, R.K. Deshmukh.2009. Legislations for seed quality regulation in India. CICR Technical Bulletin No:38. Downloaded from [www.cicr.org.in](http://www.cicr.org.in).
- The Seeds Act, 1966, G.O.I.
- CUTS. 2015.The Seeds Bill 2011, Seeking to Promote Use of Quality Seeds by Regulating Production, Distribution, Sale, Export and Import. [www.cuts-international.org](http://www.cuts-international.org)

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# Prosecution protocols and follow up actions by the Seed Inspector

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## Inspection Procedure:

1. Prior to taking seed samples, the Inspector should verify the information on the label to ensure that the seed is labeled as required under the Act in regard to the following.

### Checking information:

- a. Kind
- b. Variety
- c. Lot number
- d. Date of test
- e. Pure seed
- f. Inert matter
- g. Other crop seed
- h. Weed seed
- i. Germination
- j. Net content
- k. Seller's name and address
- l. If treated, then, either of the following two statements should appear on the label:
  - i. Do not use for food, feed or oil purposes
  - ii. Poison

If the content of the container is 250 grams or less, items [e] to [i] may be replaced by the following statement:

"The seed in this container conforms to the minimum limits of germination and purity prescribed under the Act".

The inspector should check if the information on label in regard to germination and pure seed is in conformity with the minimum limits prescribed.

2. In the case of certified seed lot(s), the Inspector should check the information on the certification tag in regard to the following:

- a. Name and address of the Certification Agency;
- b. Kind and variety of the seed;
- c. Lot number or other mark of the seed;
- d. Name & address of the certified seed producer;
- e. Date of issue of the certificate and its validity;
- f. The sign to designate certified seed;
- g. The word denoting the class designation of the seed;
- h. The period during which the seed shall be used for sowing;
- i. Condition that the use of seed after the expiry of the validity period by any person is entirely at his risk and that the holder of the certificate shall not be responsible to the buyer for any damage to the seed; and
- j. Condition that no one should purchase the seed if the seal or the certification tag has been tampered with.

The Inspector should also check if the colour of the certification tag(s) is as prescribed in the Rules and whether the tags on seed containers appear genuine and intact.

In the case of certified seed lot(s) the Inspector should also determine whether the contents of the label are in conformity with the seed standards prescribed in the Minimum Seed Certification Standards. He should also check whether revalidation has been done, in case the validity period indicated on the tag has expired. In case of doubt, relevant records should be examined.

**Steps to be followed:**

- 3.a. Give notice in writing in Form-VI of the Rules; prepare in duplicate and give original copy to the person from whose seed lot sample is to be drawn and obtain acknowledgement on the office copy;
- b. As far as possible call not less than two witnesses;
- c. Examine the information on the label and determine whether it violates the provisions of the Act and the Rules. In case violation is found take appropriate action as indicated in para-4 below.
- d. Draw, mix, divide and prepare samples for dispatch;
- e. If cost of seed is demanded confirm that the cost is at the rate at which that seed is normally sold to the public. Then pay the seed cost and fill in the remainder of the form-VIII of the Rules.
- f. Prepare form-V of the Rules in triplicate and send original copy to the Analyst along with sample, second copy to the Analyst by post / hand along with a specimen impression of the seal used for sealing the sample, give the third copy to the person from whose seed lot sample is drawn, retain the fourth copy along with file sample and the fifth copy as office copy.
- g. Record detailed information in Form-V of the Rules and detach five labels from each lot and replace them by replacement labels duly authenticated by the Department of Agriculture. Alternatively if five spare labels identical to those on the seed containers under sampling are available with the person from whose seed lots sample is drawn obtain them from the person and affix one to each of the five copies of Form-V.
- h. Prepare Form-VIII in duplicate, obtain the signatures of the witnesses, hand over the original copy to the seller and retain the second as office copy.

**Violations:**

**4. a. Rectifiable violations:**

- i. The first consideration is to establish that the seed is labeled in accordance with the Act and the Rules. The Inspector should be alert to possible labeling violations that are detectable prior to taking samples;
- ii. The Inspector can determine the deficiencies in label information, by comparing the results reported by the laboratory with those appearing on the label. When making such comparison apply, if necessary, the prescribed tolerance levels(Appendix-IV). If the deficiency is such that it can be removed or rectified, the Inspector may issue a stop sale order until the correction is carried out.
- iii. For certified seed, if the seed is being sold after the expiry of the validity period recorded on the certification tag, the Inspector may issue a stop sale order and direct the seller to get the seed revalidated by the certification agency. If validation by the certification agency reveals that the seed is not conforming to the minimum seed certification standards prescribed for the crop concerned the seller may be advised that the certification tags should be removed and relabeling done provided the seed is conforming at least to the minimum limits of germination and purity prescribed for mere labeling.

**b. Procedure for stopping sale:**

- i. Examine any record, register, document or any other material object;
- ii. If the offence is such that the defect may be removed by the possessor of the seed, order in writing in Form-III of the Rules the possessor of the seed not to dispose of any part of the seed lot for a period not exceeding thirty days; prepare in triplicate, give original copy to the person whose seed lot is under inspection, send the second copy to the Director of Agriculture or to such

authority as may be directed in this regard and obtain acknowledgement on the Inspector's office copy.

iii. During the period to which the stop sale order relates, the possessor of the seed may correct the defect(s) and intimate such action to the Inspector who on being satisfied about the removal of the defect(s) shall revoke the stop sale order as in Annexure-I to be prepared and distributed in the same manner as the stop sale order.

iv. Recommend prosecution if labeler is a persistent violator; issue Form-IV in quadruplicate, original copy to the seller, second copy to the magistrate, third copy to the Director of Agriculture or to such authority as may be directed in this regard and fourth as office copy; seize seed and records, inform a magistrate and take his orders for the custody there of and initiate further action.

**c. Non-rectifiable violations:**

The Inspector can determine this type of violation by comparing the results of the laboratory test with those appearing on the label. When making such a comparison apply if necessary the prescribed tolerance levels (Appendix -IV).

**d. Procedure:**

i. Recommended prosecution. Order in writing in Form-IV of the Rules. Seize the seed lot and records, inform a magistrate and take his orders as to the custody here of and initiate further action.

ii. If, after seizure of the stock, records etc. it is ascertained that the seed does not contravene any of the provisions of the Act, revoke the seizure order by issue of Annexure-II to be prepared and distributed in the same manner as the seizure order.

**Inspector's records:**

1. Maintain a record of all inspections made and action taken in the performance of duties including taking of samples and seizure of stocks. Submit copies of such records to the Director of Agriculture or to such authority as may be directed in this regard.

**Safety:**

2. Seed inspection is not without hazards and the following precautions should be observed:

- a. Be cautious when attempting to climb high piles of seed bags.
- b. Be cautious when working around bags piled in such a manner that they might fall.
- c. Be careful in moving piles of bags; preferably, ask the seeds man to move them.
- d. Be cautious when working in places where lighting is inadequate.
- e. Exercise care in handling treated seed.
- f. Do not enter warehouses, which are under fumigation

**Procedure:**

i. Recommended prosecution. Order in writing in Form-IV of the Rules. Seize the seed lot and records, inform a magistrate and take his orders as to the custody here of and initiate further action.

ii. If, after seizure of the stock, records etc. it is ascertained that the seed does not contravene any of the provisions of the Act, revoke the seizure order by issue of Annexure-II to be prepared and distributed in the same manner as the seizure order.

**Storing Seed Samples:**

**Storing Inspector's seed sample:**

The Act specifies that the Inspector shall retain one of the three samples prepared by him. The Inspector is responsible to see that seed samples drawn and to be retained by him are properly stored. The condition of the sample should be similar to its condition at the time of sampling,

testing or sale. The sample should be kept in this condition for at least one year. In disputed cases it must be kept for a longer period of time. Rule 37 states that:

"The sample of any seed shall, under clause ( c ) of sub-section ( 2 ) of Section 15, be retained under a cool, dry environment to eliminate the loss of viability and in insect proof or rat proof containers. The containers shall be dusted with suitable insecticides and the storage room fumigated to avoid infestation of samples by insects. The samples shall be packed in good quality containers of uniform shape and size before storage".

Obviously, the laboratory would be storing samples sent to it. To provide the kind of storage facility needed and to ensure that the Inspector's sample is truly maintained in satisfactory condition, it is recommended that a portion in the laboratory's storage room be designated for holding the Inspector's samples. Considering the limitations with the Inspector for providing the proper storage conditions, this is the only logical place to hold the Inspector's samples. Necessary safeguards should be provided to ensure that no one tampers with the Inspector's sample stored in this location. To achieve proper storage of samples two methods are suggested below. The first is the most desirable method and the second would meet the objective. These are not the only methods to use but are the ones that should meet the requirements of the Act.

### **First method**

1. Provide a special room with rodent-proofed, insulated and moisture-proofed walls, floor and ceiling. The insulation could be foam plastic such as Styrofoam or thermo Cole, expanded mica, glass wool or even rice hull. The moisture proofing could be 800 gauge polyethylene, laminated aluminum foil 1/8" coating of bitumen or less desirable, moisture-proof sealants. If water-absorbing insulation is used, the moisture proof material must be outside the insulation. There should be no windows in the room and the door should be gasketed like a refrigerator door. Since in most of India the temperature exceeds 800 F and RH exceeds 70% for three to five months in the year, refrigeration and dehumidification of the room are necessary. It is suggested that the room be dehumidified to 25% RH and the temperature maintained in the 60-70o F range. The 25% RH will help to control insects in addition to maintaining a low moisture content in seed.
2. Within the seed storage room, build wooden or metal racks to easily hold the samples. Provide metal boxes with gasketed lids. Lids can protect against rodents. Lids should not be placed on the boxes immediately after entering storage to allow time for the seed to dry to equilibrium with the RH of the room. Alternatively, drill holes in lids and bottoms of boxes to provide for air movement. The samples should be in bags which would allow a free exchange of moisture vapor so the samples dry down to equilibrium with the RH of the room.
3. The general containers such as metal boxes and those in which sample is placed should be of uniform shape and size. Number file samples systematically with the laboratory test number, the Inspector's serial number or the seeds man's lot number. The number used would depend on who is storing the sample.
4. Dust the containers with an insecticide such as DDT and fumigate the entire room periodically if any insect infestation is noticed. Aluminum phosphate tablets could be conveniently used for this purpose.

### **Second method:**

1. Provide a special room with insulation, rodent proofing and ventilation to cool and/or dry the room when weather conditions permit.
2. Within the storage room build wooden or metal racks to easily hold the samples. Provide metal boxes with gasketed lids for holding samples. These would be moisture-proof and insect-proof. To dry seed samples and maintain them dry in each box include the required quantity of dry

silica gel in a separate bag in each metal box. The silica gel acts as a desiccant, dries and maintains all samples within the box at a low moisture level. This process eliminates the room dehumidifier. An air-conditioner can increase the life span of seed in storage but is not vital if all other things are proper.

3. The general containers such as metal boxes and those in which sample is placed should be of uniform shape and size. Number file samples systematically with the laboratory test number, the Inspector's serial number or the seed man's lot number. The number used would depend on who is storing the sample.

4. Dust the containers with an insecticide such as DDT and fumigate the entire room periodically if any insect infestation is noticed. Aluminum phosphide tablets could be conveniently used for this purpose.

**Storing seller's seed sample:**

The Act and the Rules are definite about the need for a seeds man to maintain samples of seed as part of the records. Rule 13(3) states that:

"Every person selling, keeping for sale, offering to sell, bartering or otherwise supplying any seed of notified kind of variety under Section 7, shall keep over a period of three years a complete record of each lot of seed sold except that any seed sample may be discarded one year after the entire lot represented by such sample has been disposed of. The sample of seed kept as part of the complete record shall be as large as the size notified in the official Gazette. This sample, if required to be tested, shall be tested only for determining the purity".

The Inspector should provide adequate guidance to seeds men to help assure that they also develop the capacity to store samples for three years when necessary. Samples provided to them by the Inspector and samples of all seed lots sold must be stored properly.

This is for their protection and evidence against questions rose about the seed they have sold. This also applies to government-operated seed farms selling seed. One significant point is the statement at the end of Rule 13 (3) indicating that if the seed is to be tested, the testing shall be only for determining purity. This statement, undoubtedly, will be changed at some time in the future.

The concern of the drafters of the Rules centered on the ability of seeds men to keep their samples viable for three years. It was assumed that they could keep insects out of samples, but it might be difficult for them to so maintain samples that they would continue to germinate up to one year after the seed lot was sold. Obviously, determination of germination must be a part of the seed law enforcement programme and this statement would, of necessity, need to be changed as soon as it appears that seeds men can actually keep their samples for the required period of time in good, viable condition.

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# Export and Import Policy Seeds/Planting Material

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## Introduction

The export and import of seeds/planting materials are governed by the provisions of **Export and Import Policy** incorporating amendments by Ministry of Commerce as and when required. India has considerable potential for seed exports. Though export of seeds have been increasing steadily over the past years, export of seeds in India contributed less than 1.5% of the world trade. However, with the coming into effect of GATT treaty on Agriculture which will provide India with better access to markets of different countries and significant export opportunities are expected to open up for the Indian seed industry.

The export of seeds requires advance planning and intensive marketing efforts. The present export policy is designed based on the exigencies of the domestic requirement and supply situation.

Under **EXIM Policy** plants, fruits and seeds are placed in the restricted items for import. However, import of seeds are regularized through New Policy on Seed Development 1988 in accordance with Plants, Fruits and Seeds (Regulation of import into India) Order, 1989 (Proposed to amend this Order in 1998). India Seed Industry is around ₹ 22500/- Crore.

## **Import of Seeds**

The provisions regarding the imports of plants, fruits and seeds in the **EXIM Policy** areas under:

### **Plants, Fruits and Seeds**

- (a) Import of seeds of wheat, paddy, coarse cereals, pulses, oilseeds and fodder for sowing is permitted without a license subject to fulfillment of the provisions of the New Policy on Seed Development, 1988 and in accordance with a permit for import granted under the Plants, Fruits and Seeds (Regulation of Import into India) Order, 1989.
- (b) Import of seeds of vegetables, flowers, fruits and plants, tubers and bulbs of flowers, cutting, sapling, bud wood etc. of permit for import granted under the Plants, Fruits and Seeds (Regulation of Import into India) Order, 1989. However, import of poppy seeds, if permitted, shall be subject to the condition that importer shall produce a certificate from the competent authority of the country of origin that opium poppy has been grown licitly/legally in that country as per requirements of the International Narcotics Control Bureau.
- (c) Import of seeds, fruits and plants for consumption or other purposes is permitted against a license or in accordance with a Public Notice issued in this behalf or as per policy indicated in ITC (HS) classifications of exports and imports items. However, import of poppy seeds, if permitted, shall be subject to the condition that importer shall produce a certificate from the competent authority of the country of origin that opium poppy has been grown licitly/legally in that country as per requirements of the International Narcotics Control Bureau.
- (d) Import of plants, their products and derivatives shall also be subject to the provisions of the Conventions on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

## New Policy on Seed Development

The Government of India introduced a **New Policy on Seed Development** in October 1988 with the objective of making the best planning material available anywhere in the world to Indian farmers for increasing productivity and to encourage the growth of exports in seeds. The policy liberalized the parameters governing the imports of seeds and planting material.

Under this policy, only a small prescribed quantity of oil seeds, pulses, fodder and cereals is allowed for in house trials by the importer for multi-locational testing under the All India Coordinated Trial of ICAR. The new variety is tested for one crop season in ICAR's multi-locational trials. The results of the trials and evaluation are communicated to the Department of Agriculture and Cooperation (DAC) within 3 months of the end of the crop season. If the performance of the variety is found to be satisfactory in the multi-location trials, the importer can apply for bulk import of the seeds of the new variety. Bulk import of seeds of a new variety that has performed satisfactorily in ICAR trials are allowed only for a period of 2 years. Within the period of 2 years, the importer must make arrangements for commercial multiplication of the seed in India through transfer of parental lines or breeder seed and the seed production technology.

Bulk imports are not permitted beyond a period of 2 years. In the case of wheat and paddy, import of seeds is considered unnecessary, because ICAR has effective research collaborations for these crops with the International Research Institutions.

Under this policy, imports of seeds/planting material of fruits are permitted selectively by the DAFW on a case to case basis on the recommendations of the State Director of Horticulture/Agriculture subject to post-entry quarantine and such regulations as may be laid down by the Plant Protection Advisor. In the case of vegetable/flower seeds, free import of vegetable/flower seeds is permitted to specified categories of imports. No post-entry quarantine is insisted upon for the import of seeds of vegetable/flowers/ornamental plants and tubers and bulbs of flowers. Import is permitted after visual inspection, fumigation, laboratory tests and grow-out test.

Under this New Policy on Seed Development, 1988 certain stipulations were made applicable to MRTP/FERA companies. The MRTP/FERA companies were allowed to export only certified seed. Further, such companies were required to sell only certified seed and those varieties in respect of which they had foreign collaboration. Incentives to Domestic Seed Industry is also provided under this policy.

**Export of Seeds:** The export of Seed is considered New Policy on Seed Development-1988, under which the seeds are classified into the following categories:

- (a) Seeds in the restricted list of exports.
- (b) Seeds whose exports are allowed without license

The seeds on the restricted list of exports are as follows:

The seeds and planting material namely, Neem seeds, Cotton seeds, Cashew seeds and plants, Egyptian clover –Berseem seeds, fodder crop seeds, Green manure seeds other than Dhaincha, Guar seeds (whole), Linseeds, Lucerne (Alfalfa), *Medicago sativa*, Mesta seeds, *Nux vomica* seeds/bark/leaves/roots and powder thereof, onion seeds, seeds of Ornamental plants (wild variety), Paddy seeds (wild variety), Pepper cuttings or rooted cuttings of pepper, Persian clover, (Shaftal *Trifolium resupinatum*) seeds, Red sanders seeds (*Petrocarpus santalinus*), Rubber seeds, Russa grass seeds and Tufts, seeds of all forestry species, seeds of all certified oilseeds and pulses, Soybean seeds, Sandalwood seeds (*Santalum album*), Saffron seeds or Corms (Planting material for Saffron), Wheat seeds (wild variety).



Under the provisions of EXIM Policy and New Seed Policy export/import of items on the restricted list is allowed on a case to case basis under a licensing/import permit system from Director General of Foreign Trade (DGFT) Plant Protection Advisor to the Government of India, who issue licenses/import permits, respectively, on the basis of recommendations from the DAC. The producer in the DAC under which each case is considered by the EXIM Committee after reference to concerned Institution.

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# OECD Seed Certification & its importance in context to India

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&

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## Outline

- Introduction
- International (OECD) Seed Certification
- OECD Seed Schemes
- India: Participation
- Indian Vs OECD seed certification
- Status of Implementation
- Certification Charges
- Progress

## Introduction

- The Organization for Economic Co-operation and Development (OECD) is an intergovernmental organization founded in 1961
- Act as a multilateral forum to discuss, develop and reform economic and social policies
- Promote sustainable economic growth and employment, a rising standard of living and trade liberalization

## Contd...

- **Inter-governmental Organization**
  - 34 Member countries
  - Works with > 80 partner, developing and transition economies
  - Works with > 30 international organisations (IOs)
- **Multilateral Forum ...**
  - Addresses economic, social, environmental, trade and agricultural challenges
  - Economic analyses ...

## International (OECD) Seed Certification

- The OECD Schemes for the Varietal Certification referred as International (OECD) Seed Schemes
- Provides International framework for certification of seeds moving in International seed market
- Voluntary & Self financing programmes
- 61 participating countries

## OECD Seed Schemes: Objectives

- To encourage the use of "quality-guaranteed" seed in participating countries
- To authorize the use of globally recognised labels and certificates for international seed trade
- To facilitate the import and export of seed
- To enhance co-operation and understanding between
  - Importing and exporting countries
  - Public and private sector and other international organizations

## OECD Seed Schemes

There are eight broad groups of crops

- Cereals
- Maize
- Sorghum
- Grasses and legumes
- Crucifers and Other Oil or Fibre Species
- Vegetables
- Fodder Beet and Sugar Beet
- Subterranean Clover and Similar Species



### OECD Seed Schemes: Benefits

- Facilitate the International seed trade
- Provides a framework to develop seed production plans
- Internationally harmonized rules for seed certification
- Develops collaboration between the public and private sectors
- Regular exchange of information with other national certification agencies
- Improves competencies in domestic seed quality regulation system

### India: Participation

- India: become member of OECD seed schemes in October 2008
- National Designated Authority (NDA): Joint Secretary (Seeds), Ministry of Agriculture, Government of India
- Participating in six seed schemes
- NDA is responsible for implementation of the schemes



India delegation at OECD Annual Meeting, Chicago, 2008

### Implementation

- National Designated Authority is apex body for implementation of the schemes
- Registration of varieties eligible for certification in the national list of OECD
- Certification for **varietal identity and purity**
- **Control plot tests**
- **Nine State Seed Certification Agencies** identified as **Designated Authorities** for implementation of the schemes

Name of DA	Area of Operation
TSSOCA, Hyderabad	Telangana, Chattisgarh
RSSOCA, Jaipur	Rajasthan, Haryana, Punjab & MP
BSSCA, Patna	Bihar, Jharkhand, West Bengal, All North Eastern States including Sikkim and Andaman & Nicobar
MSSCA, Akola	Maharashtra, Gujarat, Daman & Diu, Dadra & Nagar Haveli & Goa
USSCA, Dehradun	Uttarakhand, HP, Delhi, Jammu & Kashmir
APSSCA	Andhra Pradesh and Orissa
UPSSCA	Uttar Pradesh
KSSCA	Karnataka
TSSCA	Tamil Nadu, Puducherry, Lakshadweep and Kerala

### OECD List of Varieties

- It is an official list of varieties of NDA as eligible for certification
- A variety proposed to be added in the OECD List of Varieties for certification must:
  - ✓ Be distinct
  - ✓ Have an acceptable "value" in at least one participating country.
  - ✓ Be maintained
  - ✓ Be included on the National Official Catalogue of the country of registration of the variety
  - ✓ 245 varieties of 24 crops listed under OECD.

### OECD varietal list: Criteria for inclusion

- Released and notified under the Seeds Act, 1966
- Filed for registration to PPV & FR Authority
- Tested under multi-location trails for two years in public system
- Export potential and Tested under multi-location trails including in-house trials for two years
- Tested outside the country for two years along with data

## Instruments of the schemes

- OECD Seed Schemes Rules and Regulations 2020
- OECD List of Varieties
- Guidelines for Control plots tests & Field Inspection of Seed Crops
- Handbook of OECD Varietal Certification In India



## OECD Labels

Indian seed category	OECD Seed category	Color code
Breeder seed	Pre-basic	White with diagonal violet stripe
Foundation seed	Basic	White
Certified seed	Certified 1st Generation	Blue
Certified seed – II	Certified 2nd Generation and successive generations	Red
Labelled seed	Not Finally Certified Seed	Grey

Indian seed certification	OECD Seed Certification
<b>1. Classes of seed</b>	
<b>Nucleus Seed:</b> <ul style="list-style-type: none"> <li>• Through maintenance breeding by the maintainers / breeders varietal characters checked.</li> <li>• Controlled and maintained by the maintainers/breeder.</li> <li>• Carries breeder's certificate.</li> <li>• Used for breeder seed multiplication.</li> </ul>	<b>Breeders Maintenance Material:</b> <ul style="list-style-type: none"> <li>• Checked against DUS Centers for the definite characters.</li> <li>• Carries Suppliers Labels.</li> <li>• Controlled and maintained by the maintainer/breeder.</li> <li>• Used for pre-basic seed multiplication.</li> </ul>
<b>Breeder Seed: (Golden Yellow Tag)</b> <ul style="list-style-type: none"> <li>□ Controlled by monitoring team of i. crop breeder, ii. Representative of Director of Seed Certification/ Assistant Director of Seed Certification, iii. Representative of NSC, iv. Farmers / producers representative</li> <li>□ Grow Out Test is employed for certain crops.</li> <li>□ Produced through Breeder Seed Production Center (BSP) based on the indent</li> <li>□ Used for foundation class seed multiplication.</li> </ul>	<b>Pre-Basic Seed: (White Label with diagonal Violet Stripe)</b> <ul style="list-style-type: none"> <li>• Controlled by official certification authority (DA) + Maintainer.</li> <li>• Undertake pre-controlled test –</li> <li>• Can not be commercialized and not for sale.</li> <li>• Produced officially by the recognized Institute/organization.</li> </ul>

Indian seed certification	OECD Seed Certification
<b>Foundation Seed: (White Colour Tag)</b> <ul style="list-style-type: none"> <li>• Controlled by official seed certification agency directly and no role of maintainer.</li> <li>• need based GOT test</li> <li>• Produced through registered seed producers / growers.</li> <li>• Can be used for foundation stage I (F1) to foundation stage II (F2) multiplication on specific cases for the open pollinated varieties with specific approval from the Director of Seed Certification.</li> <li>• Can be used for certified stage of multiplication.</li> <li>• Initial validity period of 9 months from the date of test and subsequently six months for revalidation.</li> </ul>	<b>Basic Seed: (White Label)</b> <ul style="list-style-type: none"> <li>• Controlled by official certification authority (DA) + Maintainer.</li> <li>• Undertake pre-control tests –</li> <li>• Can not be commercialized and not for sale.</li> <li>• Produced officially by the recognized Institute/organization.</li> <li>• No such validity period</li> </ul>

Indian seed certification	OECD Seed Certification
<b>Certified Seed: (Azure Blue Tag)</b>	<b>Certified Seed (C1) - (Blue Label) (C2) - (Red Label)</b>
<ul style="list-style-type: none"> <li>• Controlled by official seed certification agency directly and no role of maintainer.</li> <li>• need based GOT test</li> <li>• Produced through registered seed producers / growers.</li> <li>• Can be used for certified stage I (F1) to certified stage II (F2) multiplication on specific cases for the open pollinated varieties with specific approval from the Director of Seed Certification.</li> <li>• Can be used for certified stage II and commercial multiplication.</li> <li>• Initial validity period of 9 months from the date of test</li> </ul>	<ul style="list-style-type: none"> <li>• DA's and Controlling Authorities– under take quality control including post control test + provision of Patent Royalty to the Maintainers / Breeder's.</li> <li>• Used for the commercial multiplication/sale.</li> <li>• No such validity period is existing.</li> </ul>

Indian seed certification	OECD Seed Certification
<b>Labeled Seed: (Opal green colour)</b>	<b>Not Finally Certified Seed : (Grey Label)</b>
<ul style="list-style-type: none"> <li>➤ Produced by the producer himself and no role of certification agencies.</li> <li>➤ Label with all seed standards details and signed by the producer himself.</li> <li>➤ Producer himself responsible for varietal purity and seed standards.</li> </ul>	<ul style="list-style-type: none"> <li>Seed Which is to be exported from the country of production after field approval, but before final certification as basic or certified seed, shall be identified in fastened containers by the special label.</li> </ul>
<b>No such class of seed exist</b>	<b>Standard Seed: (Dark Yellow Label)</b> <ul style="list-style-type: none"> <li>➤ mainly exists in vegetable seed scheme.</li> <li>➤ declared by the supplier as being true to the variety and of satisfactory varietal purity.</li> <li>➤ It must conform to the appropriate conditions in the Scheme.</li> </ul>



Indian seed certification	OECD Seed Certification
<b>Eligibility of Varieties and Parental Constituents</b>	
Varieties notified under Section (5) of the Seed Act, 1966 eligible for certification	<ul style="list-style-type: none"> <li>Registered in National catalogue of Varieties.</li> <li>Country shall have national list of varieties under the OECD Schemes. (DUS) (VCU at least in country)</li> </ul>
<b>Field inspection &amp; sampling</b>	
<ul style="list-style-type: none"> <li>Done by seed certification officials and supervised by supervising authority.</li> <li>There is no system of authorization of private inspectors / seed sampler in Indian system</li> </ul>	<ul style="list-style-type: none"> <li>Done by the officials of DAs</li> <li>Can also be done by authorized inspectors/ samplers and supervised by official supervisors. (5% check sampling done by official seed samplers.)</li> </ul>

(Specific Crop standards ) IMSCS	OECD
<b>Previous Cropping</b>	
Free from volunteer crop Eg. Groundnut- 2 years Sunflower- 1 year	Minimum time interval between seed crop and any other crop of same species Crucifer spp- 5 years Other spp- 2 years Hybrid seed may not be grown of the same field in successive years.
<b>Isolation Distance</b>	
No modification of isolation distance is permitted (except maize)	Distances can be modified where there is sufficient protection from undesirable pollen or where the possibility of cross-fertilization is eliminated.
<b>Seed standards</b>	
Maximum permitted objectionable weed plants: 1. Foundation Seed : 0.010% 2. Certified Seed : 0.020% <b>Insect damage-</b> For both F.S. and C.S.- Maize and Legumes- 1% Other crops- 0.5 %	Specific permissible limit for designated diseases and weed seeds not indicated in OECD standards. No maximum permissible limits are indicated in case of insect damage.

<b>Pre and Post Control Tests</b>	
As per IMSCS, SCAs shall conduct GOT wherever it is a pre-requisite No provision of Pre and Post Control Tests	Pre control test is compulsory for Pre-basic and Basic seed. A part of every sample of Basic Seed and 5 to 10% of the Certified seed shall be checked in a post-control test conducted immediately or in the following season
<b>Issue of Certificates</b>	
For Breeder seed by the concerned Scientist in charge of Production.	The Designated Authority may issue certificates for each lot of Pre-Basic, Basic and Certified seed approved under the Scheme.
For Foundation and Certified class issued by the officers of SSCA.	
<b>Blending of Lots</b>	
No provision for blending	lots of certified seed of the same generation of one variety may be blended before or after export in accordance with the regulations of the Country. Provision for Re-packing and Re-labeling in another Country.

## Status of Implementation

Status of implementation	
<b>September 2007</b>	Submission of application to the Secretary General, OECD Secretariate
<b>April 2008</b>	OECD Evaluation Mission to India
<b>June to July 2008</b>	Indian delegation participated in the Annual Meeting of the OECD held in Chicago, USA.
<b>October 2008</b>	OECD Seed Schemes was accepted by the OECD council.
<b>November 2008</b>	Notification of the Joint Secretary (Seeds), Government of India Ministry of Agriculture as NDA for the OECD Seed Scheme

Status of implementation	
<b>January, 2009</b>	Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Rajasthan, Uttarakhand and Uttar Pradesh were nominated as Designated Authorities
<b>March, 2009</b>	Haryana, Bihar and Assam were subsequently identified as Designated Authorities.
<b>June, 2009</b>	Indian Delegation participated in the Technical Working Group and Annual Meeting of OECD at Paris
<b>February, 2010</b>	Training on OECD Seed Schemes for the members of DAs was organized by the Govt. of India at New Delhi by inviting Foreign Expert MR. David White, Seed consultant, OECD Coordinating Centre, United Kingdom( UK)
<b>June, 2010</b>	OECD Seed Scheme training in Canada under the leadership of Joint Secretary( Seeds), GOVT. of India, DAC, New Delhi
<b>July, 2010</b>	OECD Seed Schemes Workshop organized by the Govt. of India at NSRTC, Varanasi.

### Status of Implementation

<b>September, 2012</b>	Workshop on OECD Seed Schemes held at Hyderabad by inviting members of DA.
<b>January, 2013</b>	Hands on Training programme on OECD Varietal Certification and seed testing at Bengluru.
<b>April, 2015</b>	Publication of book " OECD Varietal Certification in INDIA" By Ministry of Agriculture and Farmers Welfare Govt. of India, New Delhi"
<b>October, 2015</b>	Training of OECD Seed Schemes for the members of DA's was organized by the GOVT. Of India at NSRTC, Varanasi
<b>July, 2016</b>	Telangana State Seed & Organic Certification Authority organized the National level workshop

### Status of implementation

<b>July, 2016</b>	Telangana State Seed & Organic Certification Authority organized the National level workshop
<b>November &amp; December, 2016</b>	Telangana State Seed & Organic Certification Authority in collaboration with Govt. of India organized the second International level workshop
<b>January, 2017</b>	National Task Force on OECD Seed Schemes was constituted to accelerate implementation of OECD seed schemes
<b>November, 2017</b>	Theoretical Workshop on OECD Varietal Certification at Hyderabad by inviting Foreign Experts.
<b>April, 2018</b>	Practical Workshop OECD Varietal Certification at Hyderabad by inviting Foreign Experts.
<b>September, 2018</b>	Workshop on Introduction of International ( OECD) Seed Certification at Dehradun ( Uttarakhand)
<b>January, 2020</b>	Training programme on OECD Varietal Certification in India organized by KSSOCA at Bengaluru.

### Indian list of OECD varieties

	Crops	Number of varieties		
		Public	Private	Total
<b>In the world</b> 200 species 49,899 varieties	Pulses	17	-	17
	Oilseeds	9	2	11
<b>In India</b> 20 species 237 varieties <b>Further listed</b> 10 species 73 varieties	Cotton	2	5	7
	Pearl millet	3	5	8
	Barley	4	-	4
	Rice	15	21	36
	Wheat	5	1	6
	Sorghum	4	3	7
	Maize	1	12	13
	<b>Total</b>	<b>160</b>	<b>78</b>	<b>237</b>

### OECD Certification Charges

S. No	Operational details	Grasses, legumes, cereals, maize and sorghum (Rs.)	Crucifer and other oil or fiber species seed (Rs.)	Vegetables seed (Rs.)
1	Registration charges for growers/sowing report	125	125	125
2	Field inspection charges/acre Varieties Hybrids	500 750	500 750	500-4000
3	Processing charges (per qtl.) Ginning and processing (cotton) kapas/qtl Post harvest supervision charges for 8 hrs	40 ----- -----	40 75 -----	----- ----- 1000

### OECD Certification Charges

S.No	Operational Details	Grasses, legumes, cereals, maize and sorghum (Rs.)	Crucifer and other oil or fiber species seed (Rs.)	Vegetables seed (Rs.)
4	Seed testing charges (per sample or actual)	400	400	400
5	Pre-control & post control test charges (per sample)	1000	1000	1000
6	Tag charges (per tag)	10	10	10
7	Varietal purity (DNA test) test charges (per sample or actual)	2000	2000	2000

**Note:**

1. Registration & Annual renewal charges of Seed Production Organisation is Rs.2000/- and 1000/- respectively.
2. Registration & Annual renewal charges of Seed Processing Plant is Rs.3000/- and 1000/- respectively.

### The progress on International (OECD) Seed Certification

- The TSSOCA has initiated the registration of area under the schemes from Kharif, 2016
- During the year **2016-17** an quantity of **17159.00** quintals of seed was certified under OECD seed schemes
- During **2017-18** a quantity of about **7000** quintals of seed was certified
- For **2018-19**, a quantity of about **7000** quintals of seed was certified
- For **2019-20**, a quantity of about **1000** quintals of seed was certified

**Progress of OECD Seed Production and Certification from 2013 to 2020 (RSSOCA)**

S. No	Season	Crop	Variety	Class	Qty. Certified (Qn)	Remarks
1.	Kharif 2013	Mung	RMG-240	Pro-biotic	NB	Crop failure due to YMV (Yellow Mosaic virus)
2.	Rabi 2013-14	Wheat	Raj-3765	Pro-biotic	16.00	KVK Alwar
3.	Rabi 2014-15	Wheat	Raj-3765	Pro-biotic	16.00	KVK Alwar
4.	2015-16	Mung	DFM 2-3	Pro-biotic	1.88	KVK Alwar
5.	Rabi 2016-17	Rape Seed (Byala)	PAC-401	C/5	427.30 Qn Raw Seed Skilled in TSSCA for Further Certification activities	1. UPL Rawat (Production Agency) 2. Exported in RUSSIA
6.	Rabi 2017-18	Rape Seed (Byala)	PAC-401	C/5	Absent 140 Qn Raw Seed Skilled in TSSCA for Further Certification activities	1. UPL Rawat (Production Agency)
7.	Rabi 2017-18	Hybrid Maize	CORAL (PAC-437)	C/5	Absent 250 Qn Raw Seed Skilled in TSSCA for Further Certification activities	1. UPL Rawat (Production Agency)
8.	2018-19	Wheat	RAJ-3765	Basic	1 row area about 12 quintals	RAH, Gurgaon, India
9.	RABI 2019-20	Hydra	PAC-405	C/5	250 quintals	UPL Rawat
10.	RABI 2020-21	Hydra	PAC-401	C/5	150 rows proposed	UPL Rawat

**Thank you!**

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# Introduction of Indian Minimum Seed Certification Standard

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In India seed quality has been ensured by generation system of seed multiplication, seed certification, seed quality testing in seed testing laboratory. Seed Certification officer, Seed Inspector and Seed Analyst are playing key role in making available of quality seeds to farmers. The field standards as well as seed standards to conform the seed quality which they have to follow are given in Indian Minimum Seed Certification Standard (IMSCS) book. It was published by the Central Seed Certification Board, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, New Delhi. In the following chapters we shall see the provisions given in IMSCS book.

The General Seed Certification Standards are applicable to all crops which are eligible for certification, and with field and seed standards for the individual crops, shall constitute the Minimum Seed Certification Standards. The word 'Seed' or 'seeds' as used in these standards shall include all propagating materials.

*"Seed certification is a legally sanctioned system designed to secure, maintain & make available certain prescribed standards of genetic identity physical purity, quality and seed health of notified kinds and varieties including vegetative propagating materials of crop plant varieties."*

## I. Purpose of Seed Certification

To maintain and make available to the public, through certification, high quality seeds and propagating materials of notified kind and varieties with genetic purity.

## II. Certification Agency

Certification shall be conducted by the Certification Agency notified under Section 8 of the Seeds Act, 1966.

## III. Certified Seed Producer

A person/organization who grows or distributes certified seed in accordance with the procedures and standards of the certification.

## IV. Eligibility Requirements for Certification of Crop Varieties

A variety should be notified under Section 5 of the Seeds Act, 1966 for seed certification.

## V. Classes and Sources of Seed

Four main classes of seeds are defined by the Association of Official Seed Certification Agency.

### Nucleus Seed:

- It is the initial amount of pure seed of an improved variety or notified variety or parental lines of a hybrid produced under the supervision of the evolver of that variety / Institute/ State Agriculture University.
- It is generally 100 % pure and does not contain other physical impurities.
- It is produced strictly under isolation to avoid both genetic and physical impurities.



- Vigour of the original variety or parental line should be retained in the nucleus seed.

**Breeder Seed:**

It is the progeny of nucleus seed multiplied in large area under the supervision of plant breeder/ Institute/State Agriculture University and monitored by a committee consisting of the representatives of state seed certification agency, national/ State seed corporations, ICAR nominee and the concerned breeder. It is 100 % physical and genetically pure seed.

**Foundation Seed:**

It is the progeny of breeder seed produced on the farms of State Agriculture Universities/ Other government farms and State Seed Corporations. It is 99.5 % genetically pure seed.

**Certified Seed:**

It is the progeny of foundation seed produced by registered seed growers under the supervision of seed certification agencies to maintain the seed quality as per minimum seed certification standards. It is 99% genetically pure seed.

**Truthfully labelled Seed:**

It is the category of seed produced by private seed companies and is sold under truthful labels. Companies should maintain field and seed standards suggested for quality seed production as per seed act. Labeling is compulsory but certification is voluntary.

Seed Class	Colour	Size
Breeder Seed	Golden Yellow	12 cm x 6 cm
Foundation Seed	White	15 cm x 7.5 cm
Certified Seed	Blue	15 cm x 7.5 cm
Truthfully labelled Seed	Opal Green	15 cm x 10 cm

**Objectives:**

The main objectives for which the Agency is established are-

- Act as the Seed Certification Agency under section 8 of the Indian Seeds Act. 1966
- Discharge the functions entrusted to the Seed Certification Agency under section 9 and 10 of the Seeds Act 1966; (Grant or revocation of certificate)
- Recognize varieties eligible for seed certification and annually publish lists indicating the names of such varieties
- Maintain a list of sources of breeder and foundation seeds by the Central Seed Certification Board
- Outline the procedure for submission of application for growing, harvesting, processing, labeling and tagging of seeds intended for certification
- Verify upon receipt of an application for certification that the variety is eligible for certification, and the applications submitted are in accordance with the procedure prescribed for it and the seed used for planting is from the duly approved source
- Undertake inspection of seed fields, seed processing plants and seed lots in accordance with the procedures outlined by the Central Seed Certification Board
- Regulate the processing of seeds at seed processing units

- Arrange for analysis of seed samples drawn from the seed lots produced as per procedure to verify their conformity to the prescribed standards
- Grant certificates, as per the prescribed procedure for Seed Certification
- Carry out educational programme along with the State Department of Agriculture to promote the production and use of certified seed

### **Eligibility of varieties for Certification**

Seed of only those varieties which are notified under Section 5 of the Seeds Act, 1966 are eligible for certification.

### **Unit of Certification**

For the purpose of field inspection, the entire area planted under seed production shall constitute one unit provided –

1. It shall under one variety.
2. It does not exceed ten hectares.
3. It is not divided into fields separated by more than fifty meters between them.
4. It is planted with or is meant to produce seed belonging to the same class and stage.
5. The crop over the entire area is more or less of the same stage of growth so that observations made are representative of the entire crop.
6. The total area planted, by the large corresponds to the quantity of seed reported to have been used, and the Certification Agency's permission had been obtained by economizing the seed rate.
7. Raised strictly as a single crop.
8. The crop should not lodge more than one third of the plant population, there by hindering proper certification of fields.

### **Seed Certification Procedures**

The Seed Certification Agency is the legally authorized body to manage the production, multiplication and monitoring of the seed quality as per the Seed Act 1966, seed certification is voluntary. Seeds which are certified by the Seed Certification Agency are called "certified seeds", which passes through both the field and seed standards as specified by the certification body. Seed standards are specified and uniform throughout the country, whereas the seed certification procedures and fee vary from one State to another State. The details mentioned in the following pages pertain to the State of Bihar. It may slightly vary in other States.

### **Aim of the Seed Certification Agency:**

Producing high quality seeds of the crop varieties that the notified by the Central and State Governments and make them available to the farmers is the prime aim of the Seed Certification Agency.

### **Steps Involved in Seed Certification**

1. Application for seed production
2. Registration of sowing report
3. Field inspection
4. Seed processing

5. Seed sample and seed analysis
6. Tagging and sealing

### **Application of seed production**

Any person who wants to take up certified seed production should submit a sowing report in triplicate to the Director, State Seed Certification Agency, to register the crop and season with a registration fee of Rs. 30/- (Rupees Thirty only) and prescribed certification charges. The fee is for a single crop variety for an area up to 25 acres and for a single season. Along with this fee for seed certification the label of the seed source should be submitted.

Separate sowing reports are required for different crop varieties, different classes and different stages. Separate sowing reports are required to be registered for the same crop variety if the seed production fields are separated by more than 50 meters, sowing or planting dates differ by more than 7 days and if the seed farm area exceeds 25 acres. The sowing report should reach the Director, State Seed Certification Agency within 35 days from the date of sowing or 15 days before flowering whichever is earlier. In the case of transplanted crop the sowing report should be sent 15 days before flowering.

### **Registration of sowing report**

After receiving the application of the sowing report, the Director, State Seed Certification Agency scrutinizes and registers the seed farm and duly assigns a Seed certification number for each sowing report.

### **Field inspection**

Procedure for field inspections differ among crops and among growth stages of the same crop. The following broad principles on inspection methods are common to most crops and stages of growth:

1. The field inspection work which requires technically-trained personnel, shall be performed by the persons who have been so authorized by the Certification Agency;
2. Field inspection meant to verify those factors which can cause irreversible damage to the genetic purity or seed health shall be conducted without prior notice to the seed producer;
3. Soon after the completion of the field inspection, a copy of the report shall be handed over to the seed producer or his representative.

The objective of the field inspection is to check for the factors that may affect the genetic purity and physical health of the seeds. Field inspection will be conducted by the Seed Certification Inspector (SCI) to whom the specific seed farm has been allocated. The specific date of inspection and details of the seed farm will be intimated by the Seed Certification Officer through a copy of the sowing report sent to him. Number of field inspections will differ from crop to crop depending upon the growth stages of the crop. Generally field inspections would be carried out during the following growth stages of the crop.

- Pre-flowering stage
- Flowering stage
- Post flowering and Pre-harvest stage
- Harvest time

For each crop at least two field inspections should be conducted. Apart from the assigned field inspection, the Seed Certification Inspector can visit the seed farm at any time during the crop growth stage. Two field inspections in a same seed farm are not allowed in a same day. Re-inspection should be done to confirm that the shortcomings found during the first inspection have been solved. The following things are normally checked during field inspection.

S.N.	Crops	No of Inspections	Stages of Inspection
1	Ragi, Paddy, Wheat, Cowpea Green-gram, Black gram, Red gram, Groundnut Soya beans, French beans, Cluster bean, Dolichos bean, Amaranthus	2	Flowering to harvest
2	Maize a) Inbred line, single crosses and hybrids b) Composites, synthetics and open pollinated varieties	4 2	1 <sup>st</sup> before flowering and three during silking stage 1 <sup>st</sup> pre-flowering and 2 <sup>nd</sup> during flowering
3	Hybrid Sorghum, Hybrid Bajra, Hybrid Sunflower and their parents	4	1 <sup>st</sup> before flowering, 2 <sup>nd</sup> and 3 <sup>rd</sup> during flowering & 4 <sup>th</sup> during pre-harvesting
4	Open pollinated varieties of Sorghum, Bajra, Sunflower, Sesamum and Jute	3	1 <sup>st</sup> pre-flowering, 2 <sup>nd</sup> during Flowering & 3 <sup>rd</sup> during pre-harvesting.
5	Cotton a) Hybrids b) Varieties	4 2	1 <sup>st</sup> before flowering, 2 <sup>nd</sup> and 3 <sup>rd</sup> during flowering (Emasculation and crossing) 4 <sup>th</sup> during pickings of bolls. Flowering to harvest
6	Castor		
	a) Hybrids	4	1 <sup>st</sup> before flowering 2 <sup>nd</sup> and 3 <sup>rd</sup> during flowering 4 <sup>th</sup> at pre-harvest
	b) Varieties	2	Flowering to harvest
7	Dhaincha	2	1 <sup>st</sup> before flowering 2 <sup>nd</sup> at Flowering and pod stage
8	All cucurbits and fruit vegetables (other than hybrids) viz, Brinjal, Bhindi, Tomato, Chillies, Capsicum	3	1 <sup>st</sup> pre-flowering, 2 <sup>nd</sup> during flowering and fruiting, 3 <sup>rd</sup> during mature fruit stage
9	Potato	3	1 <sup>st</sup> 45 days after sowing, 2 <sup>nd</sup> just before haulm cutting, 3 <sup>rd</sup> after haulm cutting.

10	Radish, Carrot and Turnip	3	1 <sup>st</sup> 20-30 days after sowing, 2 <sup>nd</sup> when lifted & replanted, 3 <sup>rd</sup> flowering
11	Cumin, Coriander and Fennel	3	1 <sup>st</sup> before Flowering, 2 <sup>nd</sup> 50% Flowering, 3 <sup>rd</sup> Maturity

### Rejection of the seed field

- The seed production fields, which do not conform to the required standards for any of the following factors will be rejected.
- When the size of the seed farm exceeds the registered size.
- When there is no cultivation of the crop in the registered seed farm.
- Drying of the seed farm due to water scarcity.
- Inability to carry out the minimum number of field inspections.
- Lodging of the crop in one third of the seed farm.
- Seed crop affected by flood or very poor crop management Difference found in the seed farm when compared with the sowing report.
- Not allowing the Seed Certification Officer to take the count.

### Field Counts

The number of counts taken and the method of taking counts vary from crop to crop for all crops; five counts are taken for any area upto 5 acre and an additional count is taken for every additional 5 Acre as given below:

Area of the field crops	No. of counts to be taken
Upto 5 acres (ha.)	5
5 to 10 acres	6
10 to 15 acres	7
15 to 20 acres	8
20 to 25 acres	9
25 to 30 acres	10

### What to Inspect

Basically, sources of genetic and physical contamination must be observed, and extent of their occurrence estimated. Sources of contamination can broadly be classified as follows:

#### Off Types:

Off types are the plants of the same species as that of the seed crop variety but morphologically of different characters eg. Pigmentation, plant type, stem/leaf shape and texture, size/colour of flower or fruit etc. Similarly plants of other varieties of same crop are also included in off types. To designate a plant as off type it is necessary to trace it to any variety.

#### Inseparable other crop plants

Such type of plants whose seeds are similar in size, colour etc. and are difficult to separate from the seeds of seed crop by mechanical means are inseparable other crop plants. Such plants are counted if the growth stage of these plants is such that the maturity time resembles to the seed crop and may cause mechanical admixture at the time of harvesting/threshing.

<b>Crop</b>	<b>Designated Inseparable other crops</b>
Barely	Oats, Wheat and Gram
Oats	Barely, Wheat and Gram
Wheat	Barley, Oats and Gram

### **Isolation**

A proper designated isolation distance is compulsorily be maintained in the seed fields. All precautions should be taken so that produce of rejected area of the seed field on account of isolation is not mixed with that of the certified seed field. Threshing certificate if required may be given.

### **Re-inspection**

For crops not conforming to the standards for certification at any inspection, the field may be re-inspected by the Agency on producers or seed grower/farmers request on depositing re-inspection fee, when he has removed the source of contamination in the seed field and has maintained the isolation distance and or the contaminated plants in the seed field.

The Agency may conduct one or more re-inspection over and above normal set of inspection to ensure conformity of the seed crop to the standards as per MSCS.

### **Reporting Results**

The Results of the field inspection must be reported in the prescribed inspection report of the Agency & is to be signed by the seed grower/farmer also. A copy is to be given to him on spot. Sometimes, even after following all regulations and observing normal field counts, an officer may sometimes observe defects which do not come in field counts. Under such conditions he may follow the suggested procedure:

When patches or rows off types, shedders, shedding tassels objectionable weeds, inseparable other crop plants/heads or plants affected by diseases are noticed but do not come under field counts, separate observations such as size of the patch, number of rows etc. should be made, reported and be shown on a map.

### **Harvesting, Threshing and Transportation**

Seed crop meeting field standards for certification shall be harvested, threshed and transported to the seed processing plant in accordance with the guidelines issued by the Certification Agency. During these operations, seed producer will take all precautions to safeguard the seed from admixture and other causes of seed deterioration.

### **Seed Processing and Packing Schedule**

The Certification Agency shall prepare and communicate seed processing and packing schedule to all certified seed producers soon after the certification of seed crops at field stage. The seed producers shall adhere to the schedule specified by the Certification Agency. However, re-scheduling may be accepted by the Certification Agency on the request of seed producer on genuine grounds.

### **Seed Lot**

A seed lot is a physically identifiable quantity of seed which is homogeneous. A seed lot would represent any quantity of agricultural seeds upto a maximum of 20,000 kilograms for seeds of the size of rice or larger (except maize seed, seed potato, sweet potato, yams, taro and chow-chow for

which the maximum size of the lot may be 40,000 kilograms) and 10,000 kilograms for seeds smaller than rice subject to a tolerance limit of 5.0%. The quantities in excess of the above maximum limits shall be sub-divided and separate lot identification shall be given.

### **Construction of Seed Lot Number**

Each seed lot shall be assigned a specific number in order to facilitate maintaining its identity, tracing back to its origin, handling in stores, transit etc., accounting and inventory maintenance and referring/communicating about a certain quantity of seed.

Assigning lot numbers is done as below – MAY15/ 88-12-01-01 Apr.-15-04/19-09/R2/2-31

MAY15	-	represents seed harvested in May -15.
12	-	State Code
01	-	Processing plant Code
01	-	Seed Produce Code which will trace to the particular unit of certification.

### **Seed Processing**

Seed processing means cleaning, drying, treating, grading and other operations which will improve the quality of seeds. Seed from fields which conformed to the standards of certification at field stage shall, as soon as possible after the harvest will be brought at processing plant for processing. The screen aperture specified size shall be used for cleaning and grading of seeds so that typical contaminants such as weed seeds, small seeds, damaged seeds, broken and shriveled seeds, straw, chaff, leaves, twigs, stones, soil particles etc. are removed.

### **Seed Treatment**

When a variety, seed of which is under certification is susceptible to a seed borne disease organism or when seed under certification is carrying a seed borne pathogen and a seed treatment is available which may control the disease or pathogen when properly applied, the Certification Agency may require such seed to undergo such treatment before Certification. The information about the treatment shall be displayed on seed containers.

### **Samples and Sampling of Seeds**

Soon after completion of the seed processing or after seed treatment as the case may be, the Certification Agency shall draw a representative composite sample. The quantity of seed samples so drawn shall be sufficient to provide three samples of the size of submitted sample. The composite sample will be divided into three equal parts, and one shall be sent for analysis to a notified Seed Testing Laboratory, the second part to the seed producer and retain the third part as a guard sample.

### **Seed Analysis Report**

The Seed Testing Laboratory shall analysis the seed samples in accordance with the prescribed procedure and deliver the Seed Analysis Report to the Certification Agency as soon as may be,

but not later than 30 days from the date of receipt of the samples unless the seed is subjected to such tests which require more than 30 days for completion of the test.

### **Seed Standards of Genetic Purity**

All certified seed lots shall conform to the following Minimum Standards for genetic purity unless otherwise prescribed:

<b>Class</b>	<b>Standards for Minimum Genetic Purity (%)</b>
Foundation	99.00
Certified:	
1. Varieties, composites, synthetics & multi-lines	98.00
2. Hybrids	95.00
3. Hybrids of cotton, TPS, muskmelon, brinjal & tomato	90.00
4. Hybrid castor	85.00

### **Grow-out Test**

The Certification Agency shall conduct grow-out test to determine genetic purity of a seed lot whenever it is a pre-requisite for grant of the certificate and also on the seed lots where a doubt has arisen about the genetic purity. The grow-out test can be complemented by certain related laboratory tests.

### **Re-cleaning, Re-sampling and Retesting**

When a seed lot does not meet the prescribed seed standards, the Certification Agency on the request of seed producer may permit re-cleaning, re-sampling and retesting. The re-cleaning, re-sampling and retesting shall be permitted only once.

### **Seed Standards for Insect Damage**

A seed lot under certification shall not have apparent or visible evidence of damage by insects for both Foundation and Certified seed classes in excess of 1.0% for the seeds of maize and legumes and 0.50% for the seeds other than maize and legumes unless otherwise prescribed.

### **Seed Moisture Content**

Seed standards in respect of seed moisture shall be met at the time of packing of seed. For cereals in ordinary storage conditions for 12-18 months, seed drying up to 10% moisture content appears quite satisfactory.

### **Seed Sampling and Analysis**

Seed sample should be sent to the seed testing laboratory for analysis through the Seed Certification Inspector. The fee of Rs. 40/- (Rupees forty only) for seed analysis should be paid during the sampling. To analyses the genetic purity of the seed sample, the producer should pay a fee of Rs. 300/- (Rupees three hundred only) to the Director, State Seed Certification Agency. Seeds lots which meet the prescribed seed standards like purity, free of inert matter, moisture percentage and germination capacity alone will be allotted the certification label. White colour



label for foundation seeds and blue colour label for certified seeds should be bought from the Director of Seed Certification by paying Rs. 4 and Rs. 3 respectively.

### **Packing, Tagging, Sealing and Issuance of the Certificate**

On receipt of Seed Analysis Report and the results of the grow-out test wherever prescribed, and if seed lot has met prescribed standards, the Certification Agency shall ensure packing, tagging and sealing and issuance of certificate expeditiously. An authorized official of the Certification Agency shall endorse the signature on the reverse of each certification tag and shall affix rubber stamp indicating the official's name and designation. Containers to be used for packing of the certified seeds shall be durable and free from defects.

Advance tagging may be permitted at the discretion of the Certification Agency with proper safeguards.

### **Validity period**

The certified tagged seed is valid only for a limited period of time, say nine months from the date of seed sample testing for all seed crops. If the particular seed lot is not sold out within this period, revalidation of additional six months can be made only if the seed lot meets out necessary seed standards.

### **Certification of Seeds as Organic**

A prerequisite for farmers following organic cultivation method is that they should use organically certified seeds in their farms. However, certified organic seeds are not commonly available in the market. To overcome this situation, certified organic farm could take up the production of quality certified organic seeds in consultation with the Department of Seed Certification and an Organic Certifying Agency. Farmers should follow all the organic certification standards according to the National Programme for Organic Production (NPOP) in addition to the seed certification standards for the production of certified organic seeds. For the production of such seeds, farmers have to register their land with any of the accredited organic certification bodies in India and also the seed crop with the Department or Board of Seed Certification in the respective State.

### **Service Charges for Various Operations of Seed Certification**

1	Application fee	Free
2	Registration Charges	30/- (Thirty Rs. per Application Form)
3	Inspection fee	
	Self-pollinated crops	250/- (Two hundred fifty Rs. per ha.)
	Cross pollinated crops	300/- (Three hundred Rs. per ha.)
	For sugarcane crops	250/- (Two hundred fifty Rs. per ha.)
4	Tag Charges	
	Certified tag	3.00 (Three Rs. per tag)
	Foundation tag	4.00 (Four Rs. per tag)
5	Late Fine	50.00 (fifty Rs. per application form)
6	Registration fee of processing plant (for two years)	3000.00 (Three thousand Rs. per plant)
	Renewal of processing plant (for two years)	2000.00 (Two thousand Rs. per plant)

	two years)	
7	Institutional Registration Fee (for three year)	5000.00 (Five thousand Rs. per institution)
	Renewal of Institutional Registration (for three yr.)	2000.00 (Two thousand Rs. only)
8	Re-Inspection Fee	
	Self-pollinated crops	125.00 (One hundred twenty five Rs. per ha.)
	Cross-pollinated crops	150.00 (One hundred fifty Rs. per ha.)
9	Seed Testing charges	
	Certified seed sample charges	40.00 (Forty rupees Rs. per sample)
10	Grow Out Test Charges	
	Self-pollinated crop	200.00 (Two hundred Rs. per sample)
	Cross pollinated crop	250.00 (Two thousand and fifty Rs. per Sample)
11	Processing Charges	
	Self-pollinated	3.00 (Three Rs. per qtl.)
	Cross pollinated	5.00 (Five Rs. per qtl.)
12	Spot Tagging	4.00 (Four Rs./tag only)
13	Seed transfer Charges	3.50 (Three Rs. fifty paise/qtl. only)
14	Re Validation Charge	
	Self-pollinated crop	10.00 (Ten Rs. / qtl. only)
	Cross pollinated crop	15.00 (Fifteen Rs./qtl. only)
15	Seed Retesting Charge	35.00 (Thirty five Rs./sample)
	Export Certificate	1000.00 (One thousand Rs. per certificate)

*Note: Minimum Inspection fee for vegetable seed 0.25 ha. and other varieties 0.50 ha. will paid.*

### **Certificate**

On completion of certification work SSCA shall issue a certificate under section 9(3) of the Seeds Act for each lot in triplicate indicating all the required information's, the original copy to be issued to the producer, second copy to the Agency Head Office and third copy to be retained as office copy.

### **Downgrading of Seed Class**

If a seed field or a seed lot is not found meeting prescribed standards for the class for which it has been registered but conforms to the prescribed standards to the immediate lower class, the Certification Agency may accept such seed fields/seed lots for certification to the immediate lower class provided request has been made to this effect by seed producer/production agency. However, downgrading of the seed class shall not be applicable in case of hybrids and their parents.

### **Revocation of the Certificate**

- As per the provisions under section 10 of the Seeds Act, 1966, the certificate issued by the Agency shall be revoked on following grounds:
- The certificate granted under section 9(3) of the Act has been obtained by the misrepresentation as to an essential fact or the holder of the certificate has, without reasonable cause, failed to comply with the conditions subject to which the certificate has been granted or has contravened any of the provisions of the Act or the rules may there under, then, without prejudice to any other penalty to which the holder of the certificate may

be liable under the Act after giving an opportunity to the holder of the certificate to show cause, the certificate could be revoked.

### **Refusal for Certification**

The Certification Agency shall have the authority to refuse certification of any seed production field or any lot that does not conform to the minimum standards prescribed for that particular crop either for field or for seed or for both. Such refusal will be subject to any application made to the Appellate Authority constituted under Section 11(1) of the Seeds Act, 1966.

All such appeals be made within 30 days from the date of which the decision of the Agency is communicated along with –

- A copy of decision of Certification Agency against which appeal has been referred with the grounds of objection to such decision.
- A bank draft for Rs. 100/- towards the appeal fees.

### **Appendices give the information regarding**

- I. Labelling of breeder seed
- II. Conditions for Inter-cropping during Certified Seed Production of oil seeds and pulses
- III. Certification Standards for Other Distinguishable Varieties
- IV. Determination of Other Distinguishable Varieties
- V. Maximum Lot Size
- VI. Procedure for Construction of Lot numbers
- VII. Screen Aperture Sizes of Seed Processing
- VIII. Screen Aperture Sizes for Seed Processing of Certain Varieties
- IX. Grow-out Test for Cultivar Purity
- X. Specification for Certification Tags
- XI. Model Composition of the Appellate Authority
- XII. Extension of the Validity Period
- XIII. The Central Seed Certification Board
- XIV. List of the Seed Certification Agencies.
- XV. Label for Potato Tissue Culture – Mini Tubers
- XVI. Label for Tissue Culture Propagule

### **Reference:**

IMSCS (2013) Compiled by R.K. Trivedi, & M. Gunasekaran, contributors - Vilas A. Tonapi and Manjunath Prasad, C.T, published by the Central Seed Certification Board, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, New Delhi.

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# Seed Processing, Seed Testing and Packaging in Certification System

B.S. Gupta

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## What is Seed Processing

- Seed processing is mainly a cleaning process of removing the undesirable material i.e. inert matter, weed seed, other crop seed, damaged seed, light & chaffy material from the raw seed by mechanical means to obtain the good quality seed.
- Seed cleaning is done on the basis of differences in physical properties of good & undesirable seed i.e.
  1. Seed size (Length, width and thickness)
  2. Weight/density
  3. Shape
  4. Surface texture
  5. Colour

## Steps of Seed Processing

1. Receipt/intake of raw seed from the seed growers
2. Physical verification of raw seed
3. Approval of seed processing plant
4. Drying (if necessary)
5. Pre-cleaning – preparing seeds for basic cleaning
6. Basic seed cleaning/ grading
7. Fine cleaning/grading
8. Sampling & submission of sample to STL
9. Seed treatment
10. Tagging & bagging
11. Issue of Certificate –II under Section-9 of the seed Act 1966
12. Storage- stacking of finally packed seed.

## Receipt/intake of raw seed from the seed growers

- The seed production Agency accept the raw seed from the seed growers at the seed processing plant as per the estimated yield given by the certification agency at the time of final field inspection.
- Each and every bag of raw seed should have been marked the specific identification code of the seed grower including the name of crop, variety, class & stage of seed.
- The production agency check the moisture and physical quality of raw seed with reference to admixture of other crop seed, insect damage, inert matter and after weighing issue receipt to seed grower for the quantity received.
- No raw seed intake will be entertained by the certification Agency after the cutoff date as per the crop calendar

## Physical verification of raw seed

- Seed production Agencies submit the complete information of raw seed procured by them to the certification Agency just after the cutoff date of intake.
- Certification Agency after receipt of intake list of raw seed conduct the physical verification in order to check the information submitted by seed production Agencies.
- Only physically verified stocks are entertained for further seed processing and certification.

## Approval of seed processing plant

- The Production Agency after physical verification of raw seed request for the registration/renewal of their seed processing plant.
- The certification agency conduct the inspection of seed processing plant and evaluation is done with reference to essential parameters specified for the registration/ renewal of evaluation. (format)

## Essential requirements for the registration/ renewal of seed processing plant.

- (A) **Building** – The plant should be installed in a suitable building in a spacious processing shed having sufficient light facility, exhaust and ceiling fans, sufficient working space to provide storage of raw seed around the machine and to keep the graded seed, space for packing and movement of working personals.
- (B) **Storage** – Sufficient and separate godowns for storage of each category of seed i.e. raw seed, graded seed, packed seed, under size seed, packing material & chemicals.
- (C) **Machine & other equipments** – The processing machinery should have a set of standard equipment i.e. precleaner, seed grader, indented cylinder, gravity separator, seed treator, moisture meter, bag closer, vacuum cleaner, weighing machine. All the machines should be so arranged that seeds flow continuously from beginning to end.

During the inspection of seed processing plants marks is to be allotted for specified essential requirements. Out of total 100 marks minimum 60 marks is required for the registration/renewal.

### Essential Guidelines in Seed Processing

- Every machine and their parts should be cleaned thoroughly before starting the grading and at the time of changing the crop/variety to avoid mechanical mixing.
- The total processing area should be cleaned with special reference to seed as well as impurity.
- Only one crop/variety /seed grower code should be handled in the processing area at one time.
- The prescribed size of grading screen should be selected as per the crop and variety to be processed.
- The air velocity of air screen machine should be adjusted in accordance with the quality of raw seed.
- Observe the moisture of the raw seed before starting the grading.
- Cleaning of machines of screens at regular interval is to be done to get the good quality of seed.

### Drying Importance

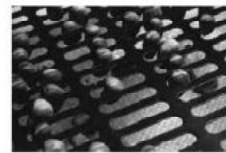
- Safe mechanical handling
- Low moisture content increases self life
- Reduces chances of insect infestation and mould growth
- Reduces loss of seed quality

### Selection of screens Screen Action



- Screens separate seed by width and thickness.
- Screens are usually made of iron sheet and are perforated with round or oblong holes.

### Screen Action



- Seed can be separated by thickness by using oblong or slotted screens. Since the seeds roll over the screens, the smallest dimension — the thickness — determines whether it will fall through the sieves.

### Selection of Screen

Size: Scalping> Seed Components Pass,  
Grading< Optimum thickness/dia. of good seeds

Shape of seed	Upper screen	Lower screen
Round	Round holes	Slotted holes
Oblong	*Slotted holes	Slotted holes

### Processing operation Phase-I : Pre-cleaning

- It is done by the pre-cleaner machine meant to prepare the raw seed for basic grading by removal of larger inert material from the raw seed and separate dust & light chaffy materials with a controlled air suction.
- Machine is having two screens upper and lower screen. The upper screen separate larger size inert material while lower screen separate the under size materials from the raw seed & pass on the good seed to the grading machine through elevators to increase the capacity of grading machine.

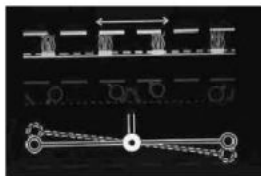


## Processing Phase-II : Basic grading

- It is done by the seed grader machine which is designed for essential process of grading on the basis of differences in the seed size and weight.
- The process of grading is operated in three ways.
  - Air suction** – The grading machine have two air systems (suction fans) designed as upper and lower air suction.
    - The upper air removes dust and light chaffy materials from the raw seed before they reach the upper screen. It is controlled by an air adjustable system.
    - The lower air suction removes the light seed and trashes from the lower screen. It is also controlled by an air adjustable system.

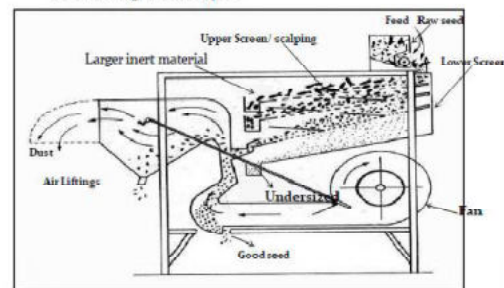
- Scalping** – The upper screen of grader further removes the larger inert material. The good seeds are dropped on lower screen through the perforation of upper screen. This screen is also called as scalper screen.
- Grading** – Lower screen of the grader, receives seed from the upper screen which flows over the openings while under size material and smaller seed, weed seed, damage seed dropped through the lower screen. The seed must flow on the screen in a single layer otherwise under size and lighter seeds material may pass with good seed to next stage & deteriorate the quality the cleaning of lower screen should be done at regular interval to avoid the clogging.

## Cleaning of Screen



- During the cleaning process the screens have to be kept clean. Brushes, balls or knockers are used to remove the seed that gets stuck in the perforations of the screens.

## Air-Screen Cleaner/Grader Working Principle



## Processing Phase-III : fine grading/up grading

- Fine grading is done mostly by using indented cylinder and gravity separators.
- Indented cylinder is specifically used for the removal of weed seed and cut seed having thickness equal to the seed size not separated by the lower screen.
- The cylinder operates on a principle of centrifugal force in which the speed of the cylinder holds good seed in the indent while weed seed and cut seed smaller than the seed length fall separately.

## Indented cylinder separator



- It consists of indents which lift particles that fit into the indents. Particles which do not fit drop out of the cell and fall downwards.

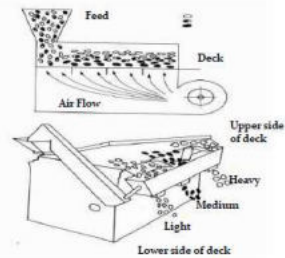
## Specific gravity separation



- Even after the seed is cleaned in the air-screen cleaner and the indented cylinder, it may be necessary to obtain higher-quality seed. In such cases, the seed can often be passed over the specific gravity separator.

## Gravity separator

- Even after the seed is cleaned in the air-screen cleaner and indented cylinder to obtain fine quality of seed, the seed can be passed over the specific gravity separator.
- It operates on a flotation principle. Separation of good seed and undesirable inert material take place on the basis of density by flotation.
- Gravity separator is having a deck with perforations and air blowing unit (fans) below the deck. The shaking deck pushes the heavy seeds upward with deck and air stream. Lighter seed towards lower side of the deck.
- Slope & Oscillation controls movement of the gravity separator.



## Formation of seed lot

- After grading certification Agency allot the lot no. to each identification code of farmer.
  - In the IMSCS a procedure for formation of lot no. is defined to induce traceability of certified seed as detailed here :
    1. **First part:** Called the harvesting month & year code- for ex., NOV 15 it explain the crop is harvested in the month of NOV, 2015
    2. **Second part:** Called the production location code and indicate State or Union Territory where the concerned seed field was located for this purpose each State is allotted a permanent numerical code by CSCE. For Rajasthan State the numerical code is 20.
    3. **Third part:** This is called processing plant code and shall indicate the seed processing plant where the relevant lot was processed. The certification Agency allot the registration no. to the seed processing plant on request of seed production Agency. For ex. Durgapura , Jaipur allotted plant no. 1
    4. **Fourth part:** The seed produce code it will indicate ultimate serial no. of an individual lot based on the raw seed of particular seed grower i.e. 01.
- All the four parts in the lot no. shall be written in series with a dash (-) between First, Second, Third & fourth parts to distinctly indicate the code no. of each part. An example is shown below:  
Lot no: NOV 15-20-01-01  
NOV 15 -Seed harvested in NOV 2015  
20 -Seed crop raised in Rajasthan  
01- Seed processed in a processing plant on Durgapura , Jaipur  
01- Seed produced code trace to the particular farmer

## Seed lot size

- Seed lot – Is a physically identifiable quantity of seed which is homogeneous.
- The seed equal to the size of wheat the maximum size of seed lot will be 200 Qtls. subjected to the tolerance limit of 5 %
- The seed less than the size of wheat the quantity maximum size of seed lot will be 100 Qtls. subjected to the tolerance limit of 5 %
- The seed more than the size of maize the maximum size of seed lot will be 400 Qtls. subjected to the tolerance limit of 5 %

## SAMPLING

- Procedure of sampling- Ensure that the entire quantity of seed to be sampled belongs to one lot.
- Determine the number of containers in the lot and the number of containers to be sampled for the lot.
- Up to 5 containers – Minimum 5 primary samples, from each container.
- 6 to 30 containers- Minimum 5 primary samples, one from every 3 containers whichever is greater.
- More than 30 – Minimum 10 primary samples, one from every 5 containers whichever is greater.

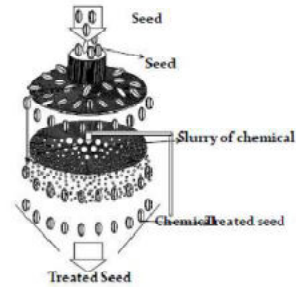
## Sampling & submission of sample to STL

- The soon after completion of the seed processing certification Agency shall draw a representative composite sample as per procedure specified in Seed Testing Manual.
- The quantity of seed samples so drawn shall be sufficient to provide three samples of the size of submitted sample. The composite sample will be divided into three equal parts and one shall be sent for analysis to a notified Seed Testing Laboratory, the second part to the seed producer and retain the third part as a guard sample.
- **Primary sample-** Several individual samples are drawn from the different containers each such sample is called a primary sample.
- **Composite sample** – All the primary samples drawn from one lot are combined to form a bulk and is called composite sample.
- **Submitted sample-** A portion of seed derived from the composite sample to be submitted for analysis to Seed Testing Laboratory is called submitted sample. (minimum size of submitted sample is specified in ISTA rules). After proper sealing the sample is to be sent to STL.

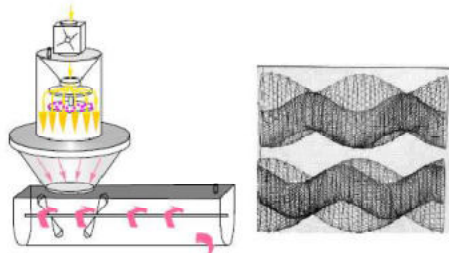
## Seed treatment

- The application of chemicals i.e. fungicides, insecticides or a combination of both, to seed so as to disinfect them from seed or soil borne pathogens and storage insects & pests.
- Method of seed treatment-
  1. Dusting- The chemicals and seed are thoroughly mixed by mechanical mixer normally at the rate of 200 to 300 gm. Chemical/qtls.
  2. Slurry- In this method the fungicide is applied to the seed in a soup like water suspension which is mixed with the seed in a special slurry treater. All foundation class seeds shall invariably be subjected to such treatment. To prepare a slurry 200 gm. of chemical mix with the 600 ml. of water for each qtls. of seed

## Seed Treater



## Seed Treater



## Tagging & bagging

- On the receipt of seed analysis report and the results of the Grow-Out Test if seed lot has met prescribed standards, the certification Agency shall ensure packing, tagging and sealing of standard seed lots in a prescribed size of packing by using a approved packing material.(format of bag, tag & label). The certification Agency keep the complete packing record including the serial no. of tags issued by them.
- Advance packing- On request of seed production Agency may permit advance packing/ tagging of graded seed with certain conditions subjected to the submission of such undertaking by the production Agency that seed shall not be moved without receipt of satisfactory results from STL and In case seed lot found substandard the tag shall be returned back to the certification Agency.
- The validity of STL results is nine months from the date of test for the fresh seed lot and six month for carry over stock.

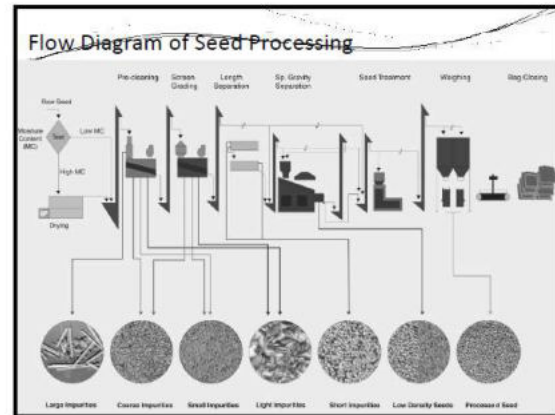
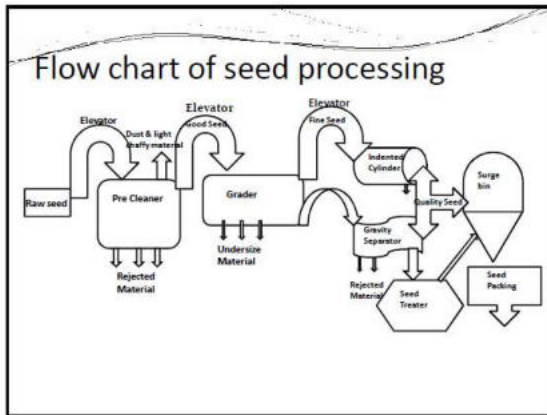
## Seed Packaging



## Issue of Certificate-II under Section-9 of the seed Act 1966

- On completion of all certification work the certification Agency shall issue a certificate II under Section-9 of the seed Act 1966 for each seed lot indicating all the required information's, regarding the seed standards, validity and serial no. of tags issued to that particular lot with the detail of seed producer.
- Now the seed shall be marketed by seed production Agency.





### Storage- stacking of finally packed seed.

- After packing of seed, it may be stored in a suitable godowns having proper ventilation, high plinth, free from leaks and insect pests.
- Seed should be stored on wooden/iron pallets
- The stacks height should not exceed more than fifteen bags in case of cereals and pulses and 8 to 10 in case of Soybean seed.
- The proper distance should be maintained between stacks of different crop, varieties.
- Each stack should have stack card with details of seed stored.
- Fumigation and chemical spray chart should also be displayed.
- Store godown should be clean and free from any undesirable inert material.
- Fumigation of stacks should be done in regular intervals as and when required.

### FORMATE OF BAG

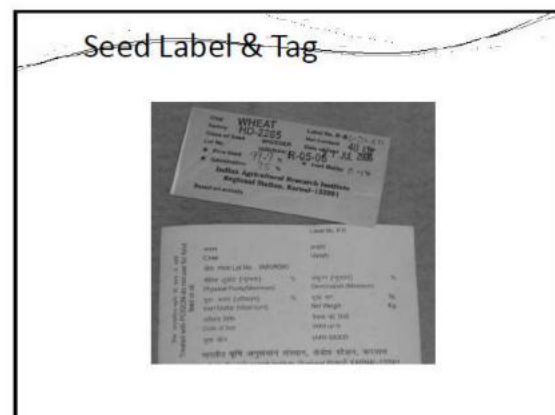
Certification Void without tag & Seal  
Class of Seed: \_\_\_\_\_ Stage: \_\_\_\_\_ (Not to be used for food, feed or oil purpose)

Crop: \_\_\_\_\_  
Variety: \_\_\_\_\_  
Lot Number: \_\_\_\_\_  
Moisture (Max. When packed): \_\_\_\_\_  
Net Weight (When packed): \_\_\_\_\_  
M.R.P.: \_\_\_\_\_  
Certified by: \_\_\_\_\_  
Rajasthan State Seed & Organic Production certification Agency, Jaipur.  
Produced and marketed by: \_\_\_\_\_  
(Address of the registered seed Producer)  
Delete whichever is not applicable:  
1. Treated with poison.  
2. Treat the seed with the chemical kept in the bag as per direction before sowing.

### SPECIFICATION FOR THE LABEL

(TO BE PRINTED BY PRODUCTION AGENCY)

- The length and breadth of the label shall be 15 X 10cm or proportionately small label may be used.
- The content of the mark or label shall contain the following information namely:  
a. Label No. ....  
b. Kind .....  
c. Variety .....  
d. Lot Number .....  
e. Date, Month and Year of test .....  
f. Valid up to .....  
g. Germination (Minimum) .....  
h. Physical Purity (Minimum) .....  
i. Genetic Purity (In case of variety) (Minimum) .....  
j. Net Weight .....  
k. Moisture, When packed, (Max) .....  
l. Name of the chemical used for seed treatment, If seed is treated .....  
m. Name and address of the person who offers for sale, sells or otherwise supplies the seed .....  
n. If seed has been treated, the following statement shall also be printed on the label  
"DO NOT USE FOR FOOD, FEED AND OIL PURPOSES"  
1. The caution for mercurial's and similarly toxic substance shall be POISON in type size, Prominently displayed on the label in RED.  
2. The colour Should resemble with opal green (IS No. 275).



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## Introduction to ISTA Rules

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Seed testing is a science of evaluating the planting value of seeds in terms seed quality parameters. It is the corner stone of quality seed supply chain and plays a critical role in ensuring genuinity of seeds and preventing farmers from sowing low quality/ substandard quality seeds, thereby protecting them from financial losses. Hence, seed testing plays an important role by providing the basis for seed trade in domestic as well as international market. Although seed testing was in practice in the early 19<sup>th</sup> century in European nations as a way to provide information on the planting value of seed to the farmers and traders, we can also find some references to the seed testing in our Indian mythologies/epics/ancient manuscripts. Though the importance of good seed was realized with the inception of agriculture; however, the concept of seed quality on scientific lines, gained importance during 1869, when Professor Friedrich Nobbe in Germany advocated that the seeds must be tested before sowing. **Nobbe's hypothesis was based on scientific investigations made by him on the vegetable and flower seed samples offered for marketing in European Countries.** This gave birth to the establishment of seed testing laboratories in European countries, USA and Canada during late eighties and early nineties. The establishment and development of seed testing laboratories in the developed world generated tremendous impact in the seed trade and the development of seed testing procedures.

Though the seed testing was in practice in the early 19<sup>th</sup> century to provide information on the planting value of seed to the farmers and traders. However, there was no uniformity in seed testing procedures across the regions. Hence, the need for having harmonized and uniform rules and procedures for seed testing had arisen and that necessitated an in-depth knowledge of plant and seed morphology, taxonomy and physiology as a prerequisite for the development of harmonized seed testing methodologies, and also the research and development activities in different areas of seed science and technology. This led to the establishment of organizations like Association of Official Seed Analysts (AOSA) in 1908 and International Seed Testing Association (ISTA) in 1924, Through these organizations, standard rules and procedures for seed testing have developed and have been adopted by many countries for the evaluation of quality of seeds moving into the domestic and international trade as well as in their seed regulatory frameworks. Therefore, it is evidenced that global organizations such as ISTA, are important in developing, maintaining and promoting the uniform application of harmonized methodologies of seed testing for facilitating seed trade domestically and globally to ensure sustainable food production.

ISTA is independent and acts free from economic interest and political influence, it is unbiased, objective and fair. Furthermore, the hitherto unsurpassed expertise of ISTA is based on the non-profit cooperation of the international community of approximately 400 experienced, competent

and energetic seed scientists and analysts. ISTA works in developing standard seed testing methods, facilitates the trade of quality seeds and makes a valuable contribution to food security. ISTA membership consists of member laboratories and sampling entities, personal members, associate members and industry members from more than 83 countries/distinct economies around the world, representing a truly a global network. The membership is a collaboration of seed scientists and seed analysts from universities, research centers and governmental, private and company seed testing laboratories around the world. ISTA values and promotes the diversity of membership, this being the basis for its independence from economic and political influence. As on date, the membership of ISTA counts **228 Member Laboratories, 264 Personal Members and 58 Associate Members** in 83 countries/distinct economies, including 142 ISTA accredited Member Laboratories, who are entitled to issue **ISTA International Seed Analysis Certificates**.

ISTA has stood for uniformity in seed testing for almost 100 years. ISTA is managed and directed by an Executive Committee, comprising of a President, Vice-President and 9 Members-at-large. All Executive Committee members are designated Members of ISTA. The finances and administration of the association is managed by the ISTA Secretariat, based in Switzerland, and lead by the Secretary General with 8 staff members. There are 20 subject-focused Technical Committees, who are responsible for the development of new methodologies for seed testing; and constituted from amongst approximately 400 members and many of which are active in more than one committee. These Technical Committees are responsible for the development of new methodologies for seed testing and each committee is headed by a chair and vice chair. ISTA Technical Committees include Advanced Technologies, Bulking and Sampling, Editorial Board of Seed Science and Technology, Flower Seed Testing, Forest Tree and Shrub Seed, Germination, GMO, Moisture, Nomenclature, Proficiency Test, Purity, Rules, Seed Health, Seed Science Advisory Group, Seed Storage, Statistics, Tetrazolium, Variety, Vigor and Wild species Working Group. The methods of the ISTA Rules are being validated, internationally harmonized and voted on by the ISTA membership.

**The objectives of the Association are:**

- (a) The primary purpose of the Association is to develop, adopt and publish standard procedures for sampling and testing seeds, and to promote uniform application of these procedures for evaluation of seeds moving in international trade.
- (b) The secondary purposes of the Association are:
  - i. To develop, adopt and publish internationally agreed standard procedures (Rules) for sampling and testing seeds.
  - ii. To promote uniform application of standard procedures for evaluation of seeds involved in international trade.
  - iii. To award accreditation to laboratories.
  - iv. To actively promote research and dissemination of knowledge in seed science and technology, for the sampling, testing, storing, processing and distribution of seeds.
  - v. To provide international seed analysis certificates and training courses.
  - vi. To encourage variety (cultivar) certification.

The ISTA membership consists of Member Laboratories, Personal Members, Associate and Industry Members.

- i. **Member Laboratory**: A Member Laboratory/Sampling Entity is one that is engaged in the testing/sampling of seed which supports the Association and its objectives and is admitted by the Association.
  - Your laboratory can participate in the Proficiency Test Programme, and once accredited by ISTA, is authorized to issue ISTA Certificates.
  - Your sampling entity participation in ISTA Proficiency Test does not apply.
  - Your laboratory/sampling entity is entitled to free online, multi-user access to the International Rules for Seed Testing.
  - Your laboratory/sampling entity will receive the bi-annual news bulletin Seed Testing International.
  - Your laboratory/sampling entity can purchase ISTA publications at the members' reduced price.
  - Laboratory/sampling entity membership allows for one Personal Member, whose postal address must be the same as that of the laboratory. This person can be the representative of the Member Laboratory in ISTA affairs and will receive a copy of newly published ISTA handbooks, free of charge upon release.
  - The Member Laboratory/sampling entity representative may be appointed by their Designated Authority to become an ISTA Designated Member and be authorized to execute the country/distinct economy's voting right on behalf of its Government at ISTA Ordinary Meetings.
  - All staff members of the Member Laboratory/sampling entity receive priority booking at any ISTA Events and benefit from reduced registration fees for ISTA Congresses, Ordinary Meetings, Symposia and Workshops.
  - The ISTA Laboratory Membership annual fee for 2023 is 5,214 Swiss Francs (CHF),
  - ISTA Laboratory Membership annual fee for 2023 is 5,214 Swiss Francs (CHF), with an additional accreditation fee of 1,224 Swiss Francs (CHF) (applies to accredited laboratories only):
- ii. **Personal Member**: A Personal Member is a person engaged in the science and practice of seed testing or in its technical control.
  - You are entitled to free online, single-user access to the International Rules for Seed Testing.
  - You will receive the bi-annual news bulletin Seed Testing International.
  - You can purchase ISTA publications at the members' reduced price.
  - You will receive a copy of newly published ISTA Handbooks, free of charge upon release.
  - You may be appointed by your Designated Authority to become an ISTA Designated Member and be authorized to execute the country/distinct economy's voting right on behalf of its government at ISTA Ordinary Meetings.
  - You receive priority booking at any ISTA Events and benefit from reduced registration fees for ISTA Congresses, Ordinary Meetings, Symposia and Workshops.
  - The ISTA Personal Membership annual fee for 2023 is 1,049 Swiss Francs (CHF)

- iii. **Associate Member**: An Associate Member is a person engaged in the science and practice of seed testing or in its technical control, who supports ISTA's objectives but is not a Personal Member.
- You are entitled to purchase single-online user access to the International Rules for Seed Testing at a reduced price of CHF 200.00 at our bookstore.
  - You will receive the bi-annual news bulletin Seed Testing International.
  - You can purchase one ISTA publication at the members' reduced price per year.
  - You benefit from one reduced registration fee for ISTA Congresses, Ordinary Meetings, Symposia and Workshops per year.
  - You cannot become an ISTA Designated Member and therefore cannot vote at ISTA Ordinary Meetings or hold office in the Association.
  - The ISTA Associate Membership annual fee for 2023 is 214 Swiss Francs (CHF)
- iv. **Industry Member**: An **Industry Member** is an organization which supports the Association and its objectives, and through paying an annual fee, provides sponsorship to the Association. An Industry Member is any entity which supports the Association and its objectives, pays an appropriate annual fee to the Association, and is admitted by the Association. The Industry Membership fee depends on the number of employees.

**The following benefits are included with membership:**

- the latest edition of the ISTA Rules in electronic format;
- new ISTA publications, including ISTA technical handbooks;
- previously issued ISTA publications at the discounted membership cost;
- participation in the ISTA Proficiency Test (PT) programme; and
- priority registration and participation in ISTA workshops and other ISTA events for all members of the laboratory or sampling entity at a reduced price provides the basis for ensuring the trade of quality seed by developing standard seed testing methods

**The other benefits accrued from ISTA membership include:**

- Provides a platform for research and cooperation between seed scientists worldwide
- Promotes research and provides the opportunity for publishing and distributing of the technological data
- Guarantees worldwide harmonized, uniform seed testing through the Accreditation, Proficiency Test and Auditing Programmes
- Provides services and professional development programmes for furthering the education and experience of seed analysts around the world.
- Provides an unbiased voice in the seed industry.

As an authority in seed science and technology, ISTA continues its role as the developer of seed testing methods. Its major achievements and services provided to date are briefly the following:

- ISTA International Rules for Seed Testing, guaranteeing worldwide annually updated, harmonized and uniform seed testing methods.
- ISTA Accreditation Programme, including Accreditation Standard, Proficiency Testing Programme and Auditing Programme guaranteeing worldwide harmonized and uniform seed testing.

- Issuance of the ISTA International Seed Lot Certificates by officially independent ISTA accredited and authorized laboratories.
- Promotion of research, training, publishing and information in all areas of seed science and technology and cooperation with related organizations such as ISF, OECD, UPOV and many others.

## ISTA Rules

ISTA is engaged in the development of standardized seed testing procedures, and produces internationally agreed rules for seed sampling and testing, whereby members work together to achieve their vision of 'Uniformity in seed quality evaluation world-wide'. The International Rules are considered as a primary tool to promote uniformity in the seed testing internationally, which facilitates seed trading nationally and internationally and also contributes to food security. The first set of International Rules of Seed Testing were framed and published by ISTA during 1931. The ISTA rules are henceforth being updated annually; which contain seed testing protocols of large number of plant species and forms the basic reference book for all kinds of seed testing activities and also for the international seed trade.

Therefore, the need for seed testing methods that are reliable and reproducible among its accredited member laboratories is a basic need for ISTA. This is achieved through the publication of the *International Rules for Seed Testing* (hereafter 'ISTA Rules'). The primary aim of the ISTA Rules is to provide testing methods for seeds designated for growing of crops or production of plants. In addition, most of the testing methods can also be applied for evaluation of the quality of seeds used as food or for technical purposes. ISTA's seed sampling and testing methods have been developed by its members since its formation in 1924. The methods have gone through appropriate validation studies to ensure that test procedures give reliable and reproducible results. Following agreement between member countries, the validated methods have been included in the ISTA Rules. Seed quality testing therefore requires test methods and equipment that have been tested to ensure they are fit for the purpose i.e. validated. The ISTA method validation provides the mechanism for the inclusion of test methods in the ISTA Rules.

The ISTA Rules contain 19 chapters, 17 of which provide internationally accepted test methods for various attributes of seed quality. The details of ISTA certificates are presented in the Chapter 1. Chapter 2 (Sampling) provides the required methods for sampling of seed lots, because for ISTA, a direct connection between the seed lot from which these samples was drawn and the results of quality tests conducted on that seed lot must always be evident. The 'end product' for an ISTA accredited laboratory following quality tests on a seed lot is an ISTA Certificate. The information on how to use ISTA Certificates is presented in Chapter 1. Each of the 19 chapters on test methods includes sections on the Object (of the test), Definitions (of terms used in the chapter), General Principles (for the test), Apparatus (required for the test), Procedure (how to conduct the test), Calculation and Expression of Results (specific to each test), Reporting Results (how to report results correctly on an ISTA Certificate), and Tolerances (statistical tables for use in determining whether test results are acceptable or not). Further, guidance has been provided in the Apparatus section to refer to a particular manufacturer's piece of equipment.

The ISTA Rules are designed for the principal crop species in the world. The species are broadly classified as agricultural and vegetable, tree and shrub, and flower, spice, herb and medicinal. ISTA encourages proposals for the addition of new species to the ISTA Rules. ISTA certificates can only be issued by ISTA accredited laboratories. For seed quality tests to be reported on an ISTA certificate is mandatory that all the requirements of ISTA rules are strictly followed. ISTA also recommends that the ISTA Rules be used by all the seed testing laboratories (including non-ISTA member laboratories) when testing seed for trade transactions which do not require use of ISTA certificate (e.g. within a country) and for the enforcement of national laws for the control of seed quality. ISTA operates an open system and the proposals to amend the ISTA Rules or to introduce new species are welcome from any source. The external proposal must be submitted to the ISTA Secretariat, following which it will be sent to the relevant Technical Committee or directly to the ISTA Rules Committee for review. The ISTA Executive Committee will either approve a proposal for consideration or request further work on the proposal. All approved Rules proposals are sent to the ISTA membership two months in advance, before the Ordinary Meeting. At the Ordinary Meeting, The ISTA voting delegates may vote to accept a proposal (to be implemented in the ISTA Rules), to withdraw a proposal (for further consideration) or to reject a proposal.

All seed quality test methods proposed for inclusion in the ISTA Rules must have gone through the ISTA Method Validation Programme. The test methods of the ISTA Rules need to be validated, internationally harmonized and voted on by the ISTA membership. This is required for both new test methods (i.e. not currently in the ISTA Rules) and modifications to the existing methods already included in the ISTA Rules, and require a four-step process:

- i. Method selection and development;
- ii. Validation through comparative testing;
- iii. Review of comparative test results and preparation of a Method Validation Report;
- iv. Approval of validation status by the relevant ISTA Technical Committee and preparation and of an ISTA Rules proposal for the method.

**Proposal for new species:**

For a proposal to introduce a new species the following information must be supplied by the applicant:

1. Names of species
2. Maximum lot size and sample size.
3. Pure seed Definition
4. Validated germination test methods
5. Validated germination test procedures
6. Validated moisture content determination methods
7. Thousand seed weight
8. Varietal identification
9. Seed health tests

**Other proposals:** Within a chapter of the ISTA Rules, a change to the existing text (e.g., introduction of a new definition) may be proposed. Providing the proposal does not directly involve a test method or new species, it should be sent directly to the ISTA Secretariat.



Today in application of the Articles there is no doubt that the International Rules for Seed Testing (ISTA Rules) are the international standard reference. The ISTA Rules are recommended for national and international trade by many national regulations and international systems, such as the OECD certification seed schemes, EU regulations and many national seed laws. The seed industry also recommends the ISTA Rules in the "ISF Rules and Usages for the Trade in Seed for Sowing Purpose".

The ISTA Rules are supported by strong pillars built in ISTA over the years:

- Strong support and input from the Designated Authorities, through participation in ISTA and in voting the Rules for seed testing, guaranteeing official recognition of the ISTA seed testing methods as tools for national and international regulations.
- Technical Committees of ISTA comprising over 255 seed experts and scientists. These develop new methods, adopt new or developing technologies, undertake validation studies that validate new methods and propose new Rules for seed testing every year that are voted on at the Ordinary General Meeting.
- ISTA accreditation scheme combined with the Proficiency Test (PT) programme guaranteeing the competency and the harmonized results of the accredited Laboratories worldwide.
- The link to Science and Technology which facilitates and stimulates innovative research contributing to the development of improved methods in seed sampling and testing.
- Strong links to Industry to ensure that progress in seed testing and sampling fits the needs of the seed sector.
- The Orange and Blue International Seed Certificates that are the outcome of all that ISTA provides: expertise in seed sampling and testing, links to seed science and technologies, input of industry, and official support, all recognized by the ISTA accreditation.
- Collaboration with other international organizations built over the years to help promote harmonization to support the seed value chain.

All these achievements require strong support in terms of:

- Time provided by the voluntary active members and non-members of the Association supported by the permanent staff of the ISTA Secretariat.
- Strong finances to support the administration of the Association (Secretariat), technical work, and method development including new technologies, the accreditation scheme and the proficiency test programme.
- Communication and training tools available for the members and available to the seed community worldwide, supported by the proactive marketing in ISTA.

### **ISTA Accreditation:**

Accreditation is defined as the procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific task. It is a process through



which a laboratory's technical competence is verified through assessment by an experienced audit team against established audit criteria. The aim of ISTA Accreditation is to verify if a seed testing laboratory is technically competent to carry out seed testing procedures in accordance with the 'ISTA International Rules for Seed Testing'. Accredited laboratories must show that they run a quality management system fulfilling the requirements of the ISTA Accreditation Standard. An accredited laboratory must satisfy two additional conditions before it can be authorized to issue ISTA certificates:

1. The laboratory must not have any financial interest in the production, processing and/or distribution of seeds.
2. The laboratory must have taken part, usually for at least three years, in the ISTA referee testing programme with conclusive results.

The laboratories accredited by ISTA are authorized to issue [ISTA Seed Lot and Sample Certificates](#). By reporting seed test results on ISTA Seed Lot Certificates, the issuing laboratory assures that the sampling and testing has been carried out in accordance with the ISTA Rules. The ISTA Certificates provide an assurance that the test results are reproducible, true and represent the quality of the seed. The certificate shall be issued in accordance with the ISTA Rules currently in force only, and on forms obtained from the International Seed Testing Association. ISTA Certificates are accepted by many authorities and are mentioned into the Seed Act of several countries. These certificates are of two kinds:

**A) Orange International Seed Lot Certificate:** This is issued when both sampling from the lot and testing of the sample are carried out under the responsibility of an ISTA-accredited laboratory. The sample is drawn officially from the lot under the authority of a member station. The lot is sealed, labeled and tested for seed quality attributes by the same member station. The orange certificate shall have the following information:

- i. Name of the issuing station
- ii. Name of the sampling and sealing agency
- iii. Official mark and seal of the lot
- iv. Number of containers in the lot
- v. Date of sampling
- vi. Date of sample received by testing station
- vii. Date of issuance of certificate
- viii. Testing station's test number
- ix. Result of tests
- x. The following statement signed by the appropriate authority of the issuing station "I certify that sampling, sealing and testing have been carried out in accordance with the International Rules for Seed Testing of ISTA and that the tests have been made at the official Station authorized by the ISTA to issue international Seed Analysis Certificate".

**B) Blue International Seed Sample Certificate:** This is issued when the sampling from the lot is not under the responsibility of an ISTA-accredited laboratory. It refers to the sample submitted

for testing and shall be printed on blue paper. Therefore, the results obtained by the ISTA-accredited laboratory apply only to the sample and not to the seed lot the sample was taken from. The information on blue certificate would be the same as given above except that of items (2) and (3) would be deleted and the statement given above in (10) shall be as follows: " I certify that testing has been carried out accordance with the International Rules for seed Testing of the ISTA and that the tests have been made at an official station authorized by the ISTA to issue International Certificates".

The Certificates are available only for accredited member laboratories, and can be purchased from the ISTA Secretariat, contacting [audit\(at\)ista.ch](mailto:audit(at)ista.ch) address, with a minimum quantity to be ordered is one box containing 100 certificates sheets. The price per sheet is in Swiss Francs CHF 3.25 and it is the same for Orange and for Blue certificates. About 200000 TA Orange International Seed Lot Certificates and Blue International Seed Sample Certificates are issued every year, facilitating seed trading internationally.

**The definitions and Abbreviations with respect to ISTA Accreditation are given below:**

**Accreditation:** A procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks.

**Accreditation body:** body that conducts and administers an accreditation system and grants accreditation.

**Audit:** systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.

**Auditor/Assessor:** person with competence to conduct an audit.

**Authorization:** approval by the ISTA Executive Committee that an ISTA accredited laboratory may issue ISTA International Seed Analysis Certificates.

**ISTA Laboratory Accreditation Standard:** document provided by the ISTA Secretariat and approved by the Executive Committee where requirements of the quality management systems are laid down. Seed testing laboratories are assessed against this standard.

**ISTA Rules:** ISTA International Rules for Seed Testing, published by the Association

**Laboratory Proficiency Test Programme:** determination of laboratory testing performance by means of inter-laboratory comparisons.

**On-site assessment:** part of the audit conducted by an ISTA audit team to verify compliance of the current quality management system with the requirements of the ISTA Laboratory Accreditation Standard which takes place in the premises of the laboratory.

**Quality Manual:** document specifying the quality management system of an organisation.

**Re-accreditation audit:** audit conducted every three years after the first audit to verify maintenance of the quality management system.

**Repeat audit:** additional assessment conducted after a (re-)accreditation audit to verify the suitability of corrective actions taken to address audit findings. This might be necessary when major non-compliances occur and removal cannot be verified through submission of documents.

**Scope of accreditation:** The scope of accreditation gives details of activities for which the laboratory is accredited in terms of methods in the current version of the ISTA Rules and species mentioned there, including methods for which a laboratory can be accredited under the Performance Based Approach. It cannot comprise methods described only in ISTA Handbooks or Working Sheets. The scope of accreditation must be documented and communicated to the staff members.

#### **The responsibilities/ obligations of an Accredited Laboratory**

- Advise the ISTA Secretariat in advance of any significant changes to its ownership, affiliation, organization, location, or any other matter relevant to its status as an ISTA accredited member laboratory. The ISTA Secretariat will then assess the effect of such changes, on a case-by-case basis, and if accreditation may be maintained or whether maintenance is dependent on the result of an audit.
- Provide any additional documentation and/or survey information relating to its accreditation, as requested by the ISTA Secretariat.
- Continuously abide by the ISTA Laboratory Accreditation Standard once accreditation is granted.
- Immediately discontinue the use of ISTA Certificates and return any unused ISTA Certificates and the Certificate of Accreditation to the ISTA Secretariat in the event of withdrawal or termination of accreditation. Conditions for termination, suspension and withdrawal of accreditation are laid down in 'Procedures for Termination, Suspension and Withdrawal of ISTA Accreditation' obtainable from the ISTA Secretariat

**Scope of the ISTA Proficiency Test (PT) Programme:** All ISTA member laboratories are eligible to participate in all PT rounds of the ISTA PT Programme. It is mandatory for ISTA accredited member laboratories (depending on their scope of accreditation) and voluntary for non-accredited laboratories who want to benchmark themselves with accredited laboratories and prepare themselves for accreditation in the future. The goal is not to identify the best seed testing laboratory in the world, but to identify those laboratories that do not meet the minimum standard of performance that is reasonably expected from an ISTA accredited laboratory and to determine if such laboratories are taking reasonable corrective action to bring their performance standard to at least the minimal level. Non-members of ISTA may participate in the ISTA PT Programme for a flat fee determined and published by the Association. Participation comprises shipment of samples, statistical analysis and reporting to the participating laboratory. Non-members who wish to participate should contact the ISTA Secretariat.

**Schedule:** Regular PT rounds are performed three times per year. Normally, a test round starts 1<sup>st</sup> of April, August and December each year with the shipment of the samples as indicated in the **Programme Plan**. Each round is made up of three samples for each test (or group of tests) that are analyzed for e.g. purity, other seed determination (OSD), germination, moisture, and/or Tetrazolium as applicable. PTs for tests other than those mentioned are currently organized by the GMO and Seed Health Committee. The latest information about the upcoming **GMO Proficiency Test and Seed Health Proficiency Test** rounds are published on their committee

websites. ISTA Members are automatically informed about upcoming GMO and Seed Health Proficiency Test rounds by email.

**Register of Accredited Laboratories:** A directory of accredited laboratories is published by ISTA, including the names of the laboratories and their scope of accreditation. Details of every new or re-accredited laboratory are published in Seed Testing International.

**Keeping of Records:** The documents concerning the accreditation process for individual laboratories are kept by the ISTA Accreditation Department.

**Confidentiality:** All information and documents regarding current accreditations and their results are kept confidential.

**Re-assessment of Accredited Laboratories:** Accreditation is valid for three years, starting from the date of the audit. A re-assessment should take place within three months of the third anniversary of accreditation.

**Use of ISTA Logo and the Way of Referring to the Accreditation Granted:** ISTA accredited laboratories may refer to their accreditation status on letters and reports. The use of the ISTA logo, which is a registered trade mark, by members for example for public relations' purposes is restricted following the regulations of the Association.

### **Benefits of ISTA Accreditation**

Seed producers who want to have their seed tested have to be sure that the results produced are reliable and reflect the true quality of the seed to be sold. These results are influenced by many factors, such as competence of analysts, use of appropriate equipment, use of validated methods, accurate recording and reporting, etc. Accreditation is a process through which a laboratory's technical competence is verified through assessment by an experienced audit team against established audit criteria. The factors that influence the test results are subjected to assessment to verify if these criteria are met. The criteria are formulated in the ISTA Accreditation Standard, which is based on the internationally agreed generic accreditation standard for testing and calibration laboratories Standard. The risk to ship seeds with faulty results on the test report shall be minimized, especially when seed lots are shipped overseas. Hence, using an accredited laboratory for testing of seed helps to increase acceptance of seed lots and thus reduces costs. In some countries, import of seed is only permitted if an ISTA Certificate accompanies the seed lot. ISTA Accreditation programme is internationally recognized and the work is endorsed by international organizations such as **Food and Agriculture Organization (FAO)**, **International Union for the Protection of New Varieties of Plants (UPOV)** and **World Trade Organization (WTO)**. The seed scheme of the **Organization for Economic Co-operation and Development (OECD)** refers to the ISTA Rules. The ISTA Rules are applied by all countries which adhere to the OECD seed certification scheme, including individual European Union (EU) countries and the EU as a whole. **International Seed Federation (ISF)** rules for trade refer to the ISTA Certificates for seed analysis as required trading documents.

## **Accreditation is beneficial to the seed seller, buyer and to the laboratory**

### **For the seed seller:**

- Issue ISTA Certificates and grow your business internationally.
- Reduce costs by using an ISTA-accredited laboratory to increase acceptance of seed lots.
- Build on Accreditation to promote your business successfully with your government, customers and stakeholders.

### **For the seed buyer:**

- Expect certainty that the results on the test report correspond to the quality of the seed lot
- Abide by the law of several countries where import of seed is only permitted if the seed lot is accompanied by an ISTA Certificate.

### **For the laboratory:**

- Evaluate your performance with the Proficiency Test programme,
- Receive formal recognition and assurance that you perform your work correctly
- Build the confidence to produce reliable results
- Seek performance and remain up to date with latest testing methods.
- Develop internal pride and staff motivation.

Accredited laboratories are reassessed in regular intervals to examine if they continuously abide by the ISTA accreditation requirements. The accredited laboratories are obliged to participate in relevant proficiency test rounds according to the testing capabilities. The failure in the proficiency test programme may lead to suspension of the accreditation. Seed producers themselves may accredit their laboratory to ensure that in-house seed testing is done correctly. Seed buyers are interested in buying seed of high quality, which is to be proofed through testing the seed lots' quality in a seed-testing laboratory. The test reports, e.g. ISTA Certificates issued by accredited laboratories provide the seed buyer with confidence that the results on the test report correspond to the quality of the seed lot. To realize the quality of the purchased seed is lower than expected is costly and sometimes even too late to do something about it.

ISTA Accreditation gives a formal recognition to seed testing laboratory; that it is technically competent to test seed using the ISTA methods and producing reliable results. Through the independent technical evaluation of a laboratory's performance, the laboratory receives assurance that its work is performed correctly and appropriately. During the on-site assessment, various aspects of the laboratory's work are looked at, improvement potential and non-conformities are identified. As accreditation is becoming more and more accepted by authorities, customers and stakeholder to be an efficient tool to evaluate a laboratory's testing performance, accreditation is in fact an important marketing tool.

All these achievements require strong support in terms of:

- Time provided by the voluntary active members and non-members of the Association supported by the permanent staff of the ISTA Secretariat.
- Strong finances to support the administration of the Association (Secretariat), technical work, and method development including new technologies, the accreditation scheme and the proficiency test programme.
- Communication and training tools available for the members and available to the seed community worldwide, supported by the proactive marketing in ISTA.

As in 2016-2019 and 2019-2022 the strategic plan for the triennium 2022-2025 flow from the four key assumptions above. For 2016-2022 the Executive Committee with the membership defined six key goals that will make major strides toward accomplishing the general aims of ISTA, with actions for each of the six goals:

- Develop scientifically sound rules and methods for seed sampling and testing that meet the needs of the seed sector
- Contribute and develop collaborations to increase seed testing capacity and capability worldwide
- Strengthen the accreditation system to ensure it meets the needs of ISTA members and other stakeholders
- Strengthen the Science and Technology underpinning ISTA to develop innovative research to make the link between scientific developments and applications in seed sampling and testing and to allow the requirements of the seed sector to be met
- Seek the needs of members, stakeholders
- Manage ISTA affairs

Good quality seed is an essential starting point for any crop production. Timely availability and access to quality seeds plays an important role in augmenting agricultural productivity. All farmers need seed where the varietal purity is guaranteed through internationally agreed certification and seed quality has been verified by laboratories operating under an internationally accepted quality system. Increasing agricultural productivity and sustainable food production are crucial to achieving the United Nation's Sustainable Development Goal 2: Zero hunger world. The international organizations such as, the OECD, ISTA, AOSA, UPOV, IPPC have been involved in the development of uniform, standard and science-based seed regulatory framework and methodologies, which have been adopted by the governments and seed industries around the world as per their national requirements and has been greatly facilitating the growth of the global seed trade. For instance, the OECD /AOSCA Seed Certification Schemes and the ISTA seed testing methods have been embedded in seed laws and regulations of many countries and they are widely used by the seed industry throughout the world. In India also, the Government of India has adopted the ISTA rules for seed testing and AOSCA model of seed certification system, which are being used in national seed quality assurance system for ensuring quality seed supply to the farmers.

ISTA is recognized as the leading international organization in setting and publishing seed sampling and seed testing methods, promoting uniform application of these procedures for

evaluation of seeds moving in domestic and international trade; promotion of innovative seed science research and education to meet the needs of the seed sector across the globe and also for cooperation in building seed testing capacity and capability, therefore making a valuable contribution to seed and food security worldwide. ISTA will continue to strengthen the global position of ISTA as an interface between seed research, industry and regulatory bodies in the coming years, that greatly facilitates the identification of needs for new methods or changes in the existing methods especially with regards to tropical and sub-tropical species. However, there is a need to expand the reach of ISTA and also find more ISTA auditors to regions, where the ISTA is underrepresented.

The global seed trade is highly dependent on the seed regulatory frameworks at national and international levels. An efficient and transparent seed regulatory system is crucial to ensure that farmers have timely access to high quality seed at an affordable price. The international seed regulatory framework consists of (i) seed certification systems based on varietal identity and varietal purity(OECD, AOSCA, EU Directives etc.); (ii) seed testing (ISTA, AOSA); (iii) phyto sanitary measures (IPPC, WTO-SPS & NPPO); and the plant variety protection (UPOV or sui generis systems). The seed regulatory frame works at regional level have also been developed to facilitate regional seed trade e.g. Central America, Mercosur, EAC,SADC, ECOWAS, etc. In their regard, the World Seed Partnership brings together five organizations (ISTA, the OECD Seed Schemes, ISF, UPOV and the World Farmers Organization) who have key roles in the development or implementation of seed systems that will enable the development and maintenance of suitable varieties of high-quality seed, and the trade and utilization of that seed by farmers. By bringing these five organizations together in the World Seed Partnership, ISTA, and the other organizations in the partnership aim to facilitate development of seed systems in those countries that do not have them or where they are less developed, by providing easier access to information and support, thus enabling to achieve the overall objective of food security.

#### REFERENCES:

1. Agrawal P.K. (1993). Handbook of Seed Testing, Dept. of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India, New Delhi, pp: 340.
2. International Seed Testing Association (ISTA) (2022). International Rules for Seed Testing. Bassersdorf, CH. Switzerland.
3. <https://www.seedtest.org/en/home.html>
4. <https://seednet.gov.in/>

*Annexure I*

**ISTA Accredited Member Laboratories in India - 8**

1. **INML0500:** Namdhari Seeds Pvt. Ltd. Quality Control Laboratory  
Sri Sai arcade, No:8, 12th cross, 1st phase, Ideal Homes Township  
PO: Rajarajeshwari Nagar, Karnataka  
Bangalore -560 098 (India)
2. **INML0600:** Mahyco Private Limited Quality Assurance Laboratory  
Jalna - Aurangabad Road, Dawalwadi, Badnapur Tq  
PO: P.O. Box 76., Maharashtra  
Jalna -431 203 (India)
3. **INML0700:** Indo-American Hybrid Seeds (India) Pvt Ltd Seed Laboratory  
7th Km, Banashankari-Kengeri Link Road,  
PO: Channasandra, Rajarajeshwarinagar Post, Karnataka  
Bangalore - 560 098 (India)
4. **INML1200:** Nuziveedu Seeds Limited (NSLICON) Seed Testing Laboratory  
Survey no: 183, Kompally  
Quthbullapur Mandal, Andhra Pradesh  
Secunderabad - 500014 (India)
5. **INML1400:** Kalash Seeds Pvt. Ltd.  
Bejo Sheetal Corner, Mantha Road  
Jalna, Maharashtra - 431203 (India)
6. **INML1600:** Seed Testing Laboratory  
Department of Seed Certification  
Lawley road, G.C.T., Tamilnadu  
Coimbatore - 641013 (India)
7. **INML3900:** Telangana State Seed & Organic Certification Authority  
5-10-193, 1st Floor, HACA Bhavan  
Public Gardens  
TS Hyderabad - 500 004 (India)
8. **INML4500:** East West Seeds India Pvt. Ltd. Quality Assurance Laboratory  
Gut Number 66, Village Narayanpur, Waluj,  
Tq. Gangapur, Maharashtra  
Aurangabad - 431133 (India)



### **Non-Accredited ISTA Member Laboratories in India - 21**

- 1. NDL0100: ICAR-Indian Agricultural Research Institute**  
Seed Testing Laboratory, Pusa Campus  
New Delhi - 110 012 (India)
- 2. INDL0300: National Seeds Corp. Ltd.**  
Quality Control Laboratory  
Beej Bhavan, Pusa Complex  
New Delhi - 110 012 (India)
- 3. INML4800: Telangana DNA Fingerprinting and Transgenic Crops**  
Monitoring Laboratory  
2nd floor SAMETI COMPLEX, Old Malakpet  
Hyderabad, Andhra Pradesh - 500 036 (India)
- 4. INML0800: Bayer BioScience Pvt. Ltd.**  
Seed Quality Assurance Laboratory  
14-111, Tatapapannapally, TOOPRAN, Medak District  
Telangana - 502 335 (India)
- 5. INML1000: J.K. Agri Genetics Ltd.**  
1-10-177, 4th Floor, Varun Towers  
Begumpet, Hyderabad, Andhra Pradesh - 500 016 (India)
- 6. INML1600: Seed Testing Laboratory**  
Department of Seed Certification  
Lawley Road, G.C.T., Coimbatore, Tamilnadu - 641 013 (India)
- 7. INML1700: Syngenta India Pvt. Ltd**  
Quality Control Laboratory  
No. 660/661, Nutankal Village  
Medchal Mandal, Ranga Reddy District  
Telangana - 502 335 (India)
- 8. INML1900: National Seed Research and Training Centre**  
Central Seed Testing Laboratory  
G.T.Road, Collectry Farm, P.O. Industrial Estate  
Varanasi, Uttar Pradesh - 221106 (India)
- 9. NML2300: AcsenHyveg (P) Ltd**  
HYVEG QA LAB., Village Nunhera, Near Toll Plaza  
Sohna-Ballabhgarh Road, Sohna  
Gurugram, Haryana- 122 103 (India)
- 10. INML2500: Rasi Seeds (P) Ltd**  
Seed Testing Laboratory  
65/1 Cadalur Main Road, Thulukanur  
Village, Ammampalayam (PO) Attur (TK)  
Salem, Tamil Nadu - 636102 (India)

- 11. INML3100: University of Agricultural Sciences**  
AICRP on Seed Tech, Gandhi Krishi Vignana Kendra  
Bangalore, Karnataka - 560001 (India)
- 12. INML3500: ICAR - Indian Institute of Seed Science**  
Vill: Kushmuar, PO: Kaithauli, MaunathBhanjan  
Uttar Pradesh - 275 103 (India)
- 13. INML3600: Kaveri Seed Company Limited**  
Seed Testing Laboratory  
Survey No. Part 707, 712 to 719, Pamulaparthi (Village)  
Wargal (Mandal), Medak (District)  
Hyderabad, Andhra Pradesh - 502279 (India)
- 14. INML3800: Seed Testing Laboratory**  
Department of Agriculture, Old Pedgaon Road, Laxminagar  
Parbhani, Maharashtra - 431401 (India)
- 15. INML4000: Quality Assurance Laboratory**  
Ajeet Seeds PVT.LTD. Aurangabad  
GUT NO-233, Village-Chitegaon  
TQ-Paithan, Dist-Aurangabad  
Aurangabad, Maharashtra - 431105 (India)
- 16. INML4100: Maharashtra State Seeds Corporation Ltd**  
Seed Testing Laboratory  
Murtizapur Road, Shivani  
Akola, Maharashtra- 444104 (India)
- 17. INML4200: Andhra Pradesh State**  
Seed Certification Authority  
Seed Testing Laboratory  
LAMFARM GUNTUR  
Guntur - 522034 (India)
- 18. INML4300: VNR Seeds Pvt. LTD Quality Assurance**  
Village -Deorjhal,AhiwaraDhamda Road  
Post - Medasara, Dist. Durg  
Chattisgarh - 493006 (India)
- 19. INML4400: Seed Works International Pvt Ltd Quality Assurance Laboratory**  
Survey No. 217/B, Ayodhya X Road,  
Kandlakoya Village, Medchal Mandal  
Hyderabad, Andhra Pradesh- 501403 (India)
- 20. INML4600: Karnataka State Seed & OrganicCertification Agency**  
State of the Art, Bellary Road, Hebbal  
Bangalore, Karnataka -560001 (India)

**21. INML4700: Advanta Enterprises Private Limited Advanta Quality Center**

Survey 315/316/324, Opp. Lane Janata

Real Estate Off, Kallakal Village

Medak Dist, Hyderabad, Andhra Pradesh- 502336 (India)

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# Overview of PPV and FR Act, 2001

Prof. (Dr.) C.P. Sachan  
Ex.Nodal Officer - DUS Project  
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## Introduction

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The **Protection of Plant Variety and Farmers Right Act, 2001 (PPVFR Act)** is an [Act](#) of the [Parliament of India](#) that was enacted to provide for the establishment of an effective system for protection of [plant varieties](#), the [rights of farmers and plant breeders](#), and to encourage the development and [cultivation](#) of new varieties of plants. This act received the assent of the [President of India](#) on the 30 October 2001.

The PPV&FR Act, 2001 was enacted to grant intellectual property rights to plant breeders, researchers and farmers who have developed any new or extant plant varieties. The Intellectual Property Right granted under PPV & FR Act, 2001 is a dual right – one is for the variety and the other is for the denomination assigned to it by the breeder. The rights granted under this Act are heritable and assignable and only registration of a plant variety confers the right. Essentially Derived Varieties (EDV) can also be registered under this Act and it may be new or extant. Farmers are entitled to save, use, sow, re-sow, exchange or sell their farm produce including seed of a registered variety in an unbranded manner. Farmers' varieties are eligible for registration and farmers are totally exempted from payment of any fee in any proceedings under this Act. The period of protection for field crops is 15 years and for trees and vines is 18 years and for notified varieties it is 15 years from the date of notification under section 5 of Seeds Act, 1966. Annual fee has to be paid every year for maintaining the registration and renewal fee has to be paid for the extended period of registration. Farmers can claim for compensation if the registered variety fails to provide expected performance under given conditions. The rights granted under this Act are exclusive right to produce, sell, market, distribute, import and export the variety. Civil and criminal remedies are provided for enforcement of breeders' rights and provisions relating to benefit sharing and compulsory License in case registered variety is not made available to the public at reasonable price are provided. Compensation is also provided for village or rural communities if any registered variety has been developed using any variety in whose evolution such village or local community has contributed significantly. The procedural details and modes of implementing this Act are provided in PPV&FR Rules, 2003.

## Objectives of the PPV & FR Act, 2001

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1. To establish an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants.
2. To recognize and protect the rights of farmers in respect of their contributions made at any time in conserving, improving and making available plant genetic resources for the development of new plant varieties.
3. To accelerate agricultural development in the country, protect plant breeders' rights; stimulate investment for research and development both in public & private sector for the development new of plant varieties.
4. Facilitate the growth of seed industry in the country which will ensure the availability of high quality seeds and planting material to the farmers.

## Three Rights System

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1. **Breeders' Rights:** Breeders will have exclusive rights to produce, sell, market, distribute, import or export the protected variety. Breeder can appoint agent/ licensee and may exercise for civil remedy in case of infringement of rights.
2. **Researchers' Rights :** Researcher can use any of the registered variety under the Act for conducting experiment or research. This includes the use of a variety as an initial source of variety for the purpose of developing another variety but repeated use needs prior permission of the registered breeder.
3. **Farmers' Rights:** The Protection of Plant Varieties and Farmers' Rights Act (PPV&FR Act) seeks to address the rights of plant breeders and farmers on an equal footing. It affirms the necessity of recognizing and protecting the rights of farmers with respect to the contribution they make in conserving, improving and making Plant Genetic Resources (PGR) available for the development of new plant varieties.

The PPV&FR Act recognizes the multiple roles played by farmers in cultivating, conserving, developing and selecting varieties. With regard to developing or selecting varieties, the Act refers to the value added by farmers to wild species or traditional varieties/ landraces through selection and identification for their economic traits. Accordingly, farmers' rights encompass the roles of farmers as users, conservers and breeders. Farmers are granted nine specific rights, which are as under:

### **Right 1: Access to seed [Section 39(1)(iv)]**

Farmers are entitled to save, use, sow, re-sow, exchange, share or sell their farm produce, including seed of protected varieties, in the same manner as they were entitled to before the coming into force of the PPV&FR Act. However, farmers are not entitled to sell branded seed of a variety protected under this Act. Farmers can use farm saved seed from a crop cultivated in their own.

### **Right 2: Benefit sharing [Section 26]**

Plant breeders and legal entities including farmers who provide Plant Genetic Resources (PGR) to breeders for developing new varieties shall receive a fair share of benefit from the commercial gains of the registered varieties. Out of all the national plant variety protection laws enacted since 2001, the PPV&FR Act is the first that integrates a provision for access and benefit-sharing (ABS) along with Plant Breeder's Rights (PBRs). Accession of the genetic resource used in breeding is permitted under the Biological Diversity Act, 2002. However, the PPV&FR Act requires a breeder to make a sworn declaration on the geographical origin of the genetic resources used in the pedigree of the new variety, and its accession.

### **Right 3: Compensation [Section 39(2)]**

Registered seed must be sold with the full disclosure of their agronomic performance under recommended management conditions. When such seed is sold to farmers but fails to provide the expected performance under recommended management conditions, the farmer is eligible to claim compensation from the breeder through the intervention of the PPV&FR Authority.

### **Right 4: Reasonable seed price [Section 47]**

Farmers have the right to access seed of registered varieties at a reasonable and remunerative price. When this condition is not met, the breeder's exclusive right over the variety is suspended under the provision concerning compulsory licensing, and the breeder is

obligated to license the seed production, distribution and sales of the variety to a competent legal entity. Most of the laws for plant variety protection have provisions on compulsory licensing of protected varieties to ensure adequate seed supply to farmers, and several of them also use unfair pricing as grounds for compulsory licensing.

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**Right 5: Farmers' recognition and reward for contributing to conservation [Section 39(i)(iii) & Section 45(2)(C)]**

Farmers who have been engaged in PGR conservation and crop improvement, and who have made substantial contributions in providing genetic resources for crop improvement, receive recognition and rewards from the national gene fund. The gene fund receives resources from the implementation of the Act, which in turn are complemented by contribution from national and international organizations. The expenditures of the fund are earmarked to support the conservation and sustainable use of PGR, and in this way it can be considered to be a national equivalent to the global benefit-sharing fund operating within the International Treaty on Plant Genetic Resources for Food and Agriculture.

Since 2007, the Plant Genome Saviour/Community awards, associated with the national gene fund, has been rewarding farming communities and individual farmers for their contribution to *in-situ* and on farm conservation to the selection of PGR. The Authority in consultation with Government of India, has established five Plant Genome Saviour Community Awards of Rs 10 Lakh each along with citation and memento to be conferred every year to the farming communities for their contribution in the conservation of Plant Genetic Resources.

In accordance with the Protection of Plant Varieties and Farmers' Rights (Recognition and Rewards from the Gene Fund) Rules, 2010 the Authority also setup ten Plant Genome Saviour Farmer Reward of Rs 1 Lakh each with citation & memento and also twenty Plant Genome Saviour Farmer Recognition annually from 2012-13 to the farmers engaged in the conservation of the Genetic Resources of the landraces and wild relatives of economics plants and their improvement through selection and preservation.

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**Right 6: Registration of farmers' varieties [Section 39(1)(iii)]**

The PPV&FR Act allows for the registration of existing farmers' varieties that fulfill requirements for distinctness, uniformity, stability and denomination, but does not include that of novelty. This right provides farmers with a one-off opportunity for a limited period of time, from the moment when a crop species is included in the crop portfolio under the PPV&FR Act for registration. Once registered, these varieties are entitled to all PBRs.

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**Right 7: Prior authorization for the commercialization of essentially derived varieties [Section 28 (6)]**

When farmers' varieties, whether extant or new, are used by a third party as source material for the development of an essentially derived variety, the farmers need to provide prior authorization for its commercialization. Such a process can allow farmers to negotiate the terms of authorization with the breeder, which may include royalties, benefit-sharing, etc.

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**Right 8: Exemption from registration fees for farmers [Section 44]**

Under PPV&FR Act, farmers have the privilege of being completely exempted from payment of any kind of fees or other payments that are normally payable for variety registration; tests for distinctness, uniformity and stability (DUS), and other services rendered

by the PPV&FR Authority; as well as for legal proceedings related to infringement or other causes in courts, tribunal, etc.

### **Right 9: Farmer protection from innocent infringement [Section 42]**

If a farmer can prove before court that he or she was not aware of the existence of any rights at the time of an infringement on any such rights, as detailed in the PPV&FR Act, he or she will not be charged. This provision is made in consideration of the centuries-old unrestrained rights that the farmers had over the seed of all varieties, the novel nature of the PPV&FR Act and the poor legal literacy of farmers.

### **Implementation of the Act**

To implement the provisions of the Act the Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare established the Protection of Plant Varieties and Farmers' Rights Authority on 11<sup>th</sup> November, 2005. The Chairperson is the Chief Executive of the Authority. Besides the Chairperson, the Authority has 15 members, as notified by the Government of India (GOI). Eight of them are ex-officio members representing various Departments/ Ministries, three from SAUs and the State Governments, one representative each for farmers, tribal organization, seed industry and women organization associated with agricultural activities are nominated by the Central Government. The Registrar General is the ex-officio Member Secretary of the Authority.

### **General Functions of the Authority**

1. Registration of new plant varieties, essentially derived varieties (EDV), extant varieties;
2. Developing DUS (Distinctiveness, Uniformity and Stability) test guidelines for new plant species;
3. Developing characterization and documentation of varieties registered;
4. Compulsory cataloging facilities for all variety of plants;
5. Documentation, indexing and cataloguing of farmers' varieties;
6. Recognizing and rewarding farmers, community of farmers, particularly tribal and rural community engaged in conservation and improvement;
7. Preservation of plant genetic resources of economic plants and their wild relatives;
8. Maintenance of the National Register of Plant Varieties and
9. Maintenance of National Gene Bank.

### **Registration of varieties**

A variety is eligible for registration under the Act if it essentially fulfills the criteria of Distinctiveness, Uniformity and Stability (DUS). The Central Government issues notification in official Gazettes specifying the genera and species for the purpose of registration of varieties. So far, the Central Government has notified 157 crop species for the purpose of registration. To access the list, The PPV&FR Authority has developed "

### **Fees for registration**

Application for registration of plant varieties should be accompanied with the fee of registration prescribed by the Authority. Fee for registration for different types of variety is as under:



S.No	Types of Variety	Fees for Registration
1	Extant Variety notified under section 5 of the Seeds Act, 1966	Rs 2000/-
2.	New Variety/Essentially Derived Variety (EDV)/ Extant Variety about which there is common knowledge (VCK)	<ul style="list-style-type: none"> <li>• Individual Rs. 7000/-</li> <li>• Educational Rs.10000/-</li> <li>• Commercial Rs.50000/-</li> </ul>
3.	Farmers Varieties	No Fee

The Registration of a variety is renewable subject to payment of annual and renewal fee as notified in the Plant Variety Journal of India of the Authority and Gazette of India dated 15.06.2015.

### **DUS Test Centers**

Authority has notified DUS test Centers for different crops with a mandate for maintaining and multiplication of reference collection, example varieties and generation of database for DUS descriptors as per DUS guidelines of respective crops. To access the list of DUS test Centers.

### **Certificate of Registration**

The certificate of registration issued will be valid for nine years in case of trees and vines and six years in case of other crops. It may be reviewed and renewed for the remaining period on payment of renewal fees subject to the condition that total period of validity shall not exceed eighteen years in case of trees and vines from the date of registration of the variety, fifteen years from the date of notification of variety under the Seeds Act, 1966 and in other cases fifteen years from the date of registration of the variety.

### **Benefit Sharing**

The benefit sharing is one of the most important ingredients of the farmers' rights. Section 26 provides benefits sharing and the claims can be submitted by the citizens of India or firms or non-governmental organization (NGOs) formed or established in India. Depending upon the extent and nature of the use of genetic material of the claimant in the development of the variety along with commercial utility and demand in the market of the variety breeder will deposit the amount in the Gene Fund. The amount deposited will be paid to the claimant from National Gene Fund. The Authority also publishes the contents of the certificate in the PVJI for the purpose of inviting claims for benefits sharing.

### **Rights of Community**

1. It is compensation to village or local communities for their significant contribution in the evolution of variety which has been registered under the Act.
2. Any person/group of persons/governmental or non- governmental organization, on behalf of any village/local community in India, can file in any notified centre, claim for contribution in the evolution of any variety.

### **Convention countries**

Convention country means a country which has acceded to an international convention for the protection of plant varieties to which India has also acceded or a country

which has law of protection of plant varieties on the basis of which India has entered into an agreements for granting plant breeders' rights to the citizen of both the countries. Any person if applies for the registration of a variety in India within twelve months after the date on which the application was made in the convention country, such variety shall, if registered under this Act, be registered as of the date on which the application was made in convention country and that date shall be deemed for the purpose of this Act to be the date of registration.

### **Plant Varieties Protection Appellate Tribunal**

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There is transitory provision by which it is provided that till the PVPAT is established the Intellectual Property Appellate Board (IPAB) will exercise the jurisdiction of PVPAT. Consequently the Plant Varieties Protection Appellate Tribunal (PVPAT) has been established by appointing Technical Member. All orders or decisions of the Registrar of Authority relating to registration of variety and orders or decisions of the Registrar relating to registration as agent or licensee can be appealed in the Tribunal. Further, all orders or decisions of Authority relating to benefit sharing, revocation of compulsory license and payment of compensation can also be appealed in the Tribunal. The decisions of the PVPAT can be challenged in High Court. The Tribunal shall dispose of the appeal within one year.

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# Introduction to Seed Rules 1968 - An overview

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Seed is the basic input for agriculture and seed quality is the very important aspects of crop production, it must be maintained during the production, processing, storage and marketing. Government of India had framed and brought out several legislations to protect the quality of seeds and planting materials for the last six decades. First Indian Seed Act was introduced in 1966 but before that, there were local legislation relating to the use of seeds. The laws which were present that time were like The Punjab Seeds and Seedling Act, 1950 and Hyderabad Improved Seed and Seedlings Act etc. The Seed Rule, 1968 was promulgated under essential commodities act, 1955 in order to ensure the production, marketing and equal distribution of the seeds.

The objective of Seed Act is to regulate the quality of certain notified kind / varieties of seeds for sale and for matters connected therewith. The Seed Act 1966 made provision to frame seed rule 1968, the act helps in the establishment of apex organizations like Central Seed Committee for advising the state and central government on all matter related to seed, Central Seed Certification Board to advise all the state seed certification agencies and it also provided the establishment of central and state seed testing laboratories for testing of seed quality.

The Seed Rules 1968 provides for the minimum quality standards and certification for notifying various kinds and varieties. According to the contents, these 25 sections may be classified as (1) General purpose sections(15 Sections), (2) Seed Certification purpose sections (05 Sections) and (3) Seed Law Enforcement sections (05 Sections). The rules were framed to implements various legislation given under Seed Act 1966.

## *Important sections of Seed Act 1966*

- Establishment of central seed committee (Section-3)
- Establishment of central and state seed testing laboratories (Section-4)
- Notification of kind and varieties (Section-5)
- Fixation of minimum limits of germination and pure seed (Section-6)
- Constitution of seed certification agencies (Section-8)
- Appointment of a seed analyst (Section-12)
- Appointment of seed inspector (Section-13)
- Penalty or punishment for those who not comply the any provision of steps act (Section-19)
- Power to make rules. (Section-25)

The rules were designed to implement various elements of the Seed Act 1966 and contain 11 parts.

## **I. Preliminary**

The first section provides definitions of various terminology used under the seed rule such as "Act" means the Seeds Act, 1966 (54 of 1966); "advertisement" means all representations other than those on the label, disseminated in any manner or by any means relating to seed for the purposes of the Act.

## **II. Central Seed Committee**

This section describes the functions entrusted to the central seed committee by the act such as

- (a) Recommend the rate of fees to be levied for analysis of samples by the Central and State Seed Testing Laboratories and for certification by the certification agencies;
- (b) Advise the Central or State Governments on the suitability of seed testing laboratories;
- (c) Send its recommendations and other concerning records to the Central Government;
- (d) Recommend the procedure and standards for certification, tests and analysis of seeds; and
- (e) Carry out such other functions as are supplemental, incidental or consequential to any of the functions conferred by the Act or these rules.

## **III. Central Seed Laboratory**

In this section it describes the specific functions entrusted to the Central Seed Laboratory such as coordinating with State Seed Laboratories and any other function assigned to it by the Central Government.

- (a) Initiate testing programmes in collaboration with the State Seed Laboratories designed to promote uniformity in test results between all seed laboratories in India.
- (b) Collect data continually on the quality of seeds found in the market and make this data available to the Committee; and
- (c) Carry out such other functions as may be assigned to it by the Central Government from time to time.

## **IV. Seed Certification Agency**

This section deals with the specific functions entrusted to the Certification Agency such as outlining the procedure for submission of applications, growing, harvesting and processing and storage of seeds intended for certification, maintaining a list of recognized nucleus seed breeders, inspections of seed production fields, seed processing plant and seed stores, grant of certificates. In addition to the functions entrusted to the certification agency by the Act, the Agency shall-

- (a) Certify seeds of any notified kinds or varieties;
- (b) Outline the procedure for submission of applications and for growing, harvesting, processing, storage and labeling of seeds intended for certification till the end to ensure that seed lots finally approved for certification are true to variety and meet prescribed standards for certification under the Act or these rules;
- (c) Maintain a list of recognized breeders of seeds;
- (d) Verify, upon receipt of an application for certification that the variety is eligible for certification, that the seed source used for planting was authenticated and the record of purchase is in accordance with these rules and the fees have been paid;
- (e) Take sample and inspect seed lots produced under the procedure laid down by the certification agency and have such samples tested to ensure that the seed conforms to the prescribed standards of certification;
- (f) Inspect seed processing plants to see that the admixtures of other kinds and varieties are not introduced;
- (g) Ensure that action at all stages, e.g. field inspection, seed processing plant inspection, analysis of samples taken and issue of certificates (including tags, marks, labels and seals) is taken expeditiously;
- (h) Carry out educational programmes designed to promote the use of certified seed including a publication listing certified seed growers and sources of certified seed;
- (i) Grant certificates (including tags labels, seals etc.) in accordance with the provisions of the Act and these rules;

- (j) Maintain such records as may be necessary to verify that seed plants for the production of certified seed were eligible for such planting under these rules;
- (k) Inspect fields to ensure that the minimum standards for isolation, roguing (where applicable) use of male sterility (where applicable) and similar factors are maintained at all times, as well as ensure that seed borne diseases are not present in the field to a greater extent than those provided in the standards for certification.

## **V. Marketing or Labeling**

Rules for marking or labeling of seed lots indented for certification have been provided in this section. The label should contain name of the person or agency that produced the seed and shall be responsible for the accuracy of information given in the unopened original container. The label should contain the name, the address of the person offering the sale of the seed, name of the variety, germination and purity level of the seed, net weight of the seed, date of seed testing and a statement if the seed is treated. Any transparent cover used solely for the purpose of packing during transport or delivery need not be marked or labeled.

## **VI. Requirements for Certification**

Three classes of certified seed have been specified in this section, viz. Foundation (progeny of breeder seed), Registered (progeny of foundation seed) and Certified (progeny of registered foundation seed) and each class shall meet the specific standards. Certification agency has the discretion of producing certified seed from certified seed provided that it does not exceed three generation and the genetic purity is not significantly altered.

Requirements to be complied with by a person carrying on the Business referred to in Section 7.

- (1) No person shall sell, keep for sale, offer to sell, barter or otherwise supply any seed of any notified kind or variety, after the date recorded on the container, mark or label as the date up to which the seed may be expected to retain the germination not less than that prescribed under clause (a) of section 6 of the Act.
- (2) No person shall, obliterate or deface any mark or label attached to the container of seed.
- (3) Every person selling, keeping for sale, offering to sell, bartering or otherwise supplying any seed of notified kind or variety under section 7, shall keep over a period of three years a complete record of each lot of seed sold except that any seed sample may be discarded one year after the entire lot represented by such sample has been disposed of. The sample of seed kept as part of the complete record shall be as large as the size notified in the official Gazette. This sample, if required to be tested, shall be tested only for determining the purity.

### **Classes and sources of certified seed.**

There shall be three classes of certified seed, namely, foundations, registered and certified and each class shall meet the following standards for that class: -

- (a) Foundation seed shall be the progeny of breeders' seed, or be produced from foundation seed which can be clearly traced to breeder's seed. Production shall be supervised and approved by a seed certification agency and be so handled as to maintain specific genetic purity and shall be required to meet certification standards for the crop being certified.
- (b) Registered seed shall be the progeny of foundation seed that is so handled as to maintain its genetic identity and purity according to standard specified for the crop being certified.

- (c) Certified seed shall be the progeny of registered or foundation seed with maintained genetic identity and purity according to standards specified for the particular crop being certified.

## **VII. Certification of seeds**

The detailed procedure of seed certification starting from applying for certification till the grant of certificate has been provided in this section.

### **Application for the Grant of a Certificate.**

Every application for the grant of a certificate under sub-section (1) of section 9 shall be made in Form I in accordance with the procedure outlined by the certification agency for submission of applications and contain the following particulars, namely: -

- (a) The name, profession, and place of residence of the applicant;
- (b) The name of the seed to be certified; its notified kind or variety;
- (c) Class of the seed;
- (d) Source of the seed;
- (e) Limits of germination and purity of the seed;
- (f) Mark or label of the seed.

### **Grant of Certificate-**

Every certificate granted under sub-section (3) of section 9 shall be in Form II and shall be granted by the certification agency, after making enquiries and satisfying itself in accordance with the provisions of the said sub-section on the following conditions, for the period to be specified by the certification agency, namely: -

- (i) The person to whom the certificate is granted under sub-section (3) of section 9 shall attach a certification tag to every container of the certified seed and shall follow the provisions in respect of marking or labeling provided by or under the Act.
- (ii) The certification tag shall contain the following particulars, namely: -
  - (a) name and address of the certification agency;
  - (b) kind and variety of the seed;
  - (c) lot number or other mark of the seed;
  - (d) name and address of the certified seed producer;
  - (e) date of issue of the certificate and of its validity;
  - (f) an appropriate sign to designate certified seed;
  - (g) an appropriate word denoting the class designation of the seed.
- (iii) The colour of the certification tag shall be white for foundation seed, purple for registered seed and blue for certified seed.
- (iv) The container of the certified seed shall carry a seal of such material and in such form as the certification agency may determine and no container carrying a certification tag shall be sold by the person if the tag or seal has either been tampered with or removed.
- (v) The certification tag on the container shall specify-
  - (a) the period during which the seed shall be used for sowing or planting;
  - (b) that the use of seed after the expiry of the validity period by any person is entirely at his risk and the certificate holder shall not be responsible for any damage to the seed buyer.
  - (c) that no one should purchase the seed if the seal or the certification tag has been tampered.
- (vi) The holder of the certificate shall keep record of the details of each lot of the seed which is issued for sale in such form as to be available for inspection and to be easily

identified by reference to the number of the lot as shown in the certification tag of each container and such records shall be retained in the case of a seed for which expiry date is fixed for a period of two years from the expiry of such date.

- (vii) The holder of the certificate shall allow any Seed Inspector, authorised in writing by the certification agency in that behalf, to enter with or without prior notice the premises where the seeds are grown processed and sold and to inspect premises, plant and the process of processing at all reasonable hours.
- (viii) The holder of the certificate shall allow the Seed Inspector, authorised in writing by the certification agency, to inspect all registers and records maintained under these rules and to take samples of the seeds and shall supply to the Seed Inspector such information as he may require for the purposes of ascertaining whether the conditions subject to which the certificate has been granted, have been complied with.
- (ix) The holder of the certificate shall on request furnish to the certification agency from every lot of the seed or from such lot or lots as the said agency may from time to time specify, a sample of such quantity as the agency may consider adequate for any examination required to be made.
- (x) If the certification agency so directs, the holder of the certificate shall not sell or offer for sale any lot in respect of which a sample is furnished under the preceding clause until the agency authorizes the sale of such lot.
- (xi) The holder of the certificate shall on being directed by the certification agency that any part of a lot has been found by the said agency not to conform to prescribed standards of quality or purity specified by or under the Act, withdraw the remainder of that lot from sale and so far as may, in the particular circumstances of the case, be practicable, recall all issues already made from that lot.
- (xii) The holder of the certificate shall comply with the provisions of the Act and these rules and with the directions given after not less than one month's notice by the certification agency to such holder.

### **VIII. Appeal**

Provision for appeal has been provided by submitting a memorandum accompanied by a treasury receipt for Rs. 100. The appellate authority shall exercise all the powers which a court has, while deciding appeal under the code of civil procedure, 1908.

The form and manner in which and the fee on payment of which the appeal may be referred. –

- (1) Every memorandum of appeal under sub-section (1) of section 11 shall be in writing and shall be accompanied by a copy of the decision of the certification agency against which it has been preferred and shall set forth concisely and under distinct heads the grounds of objection to such decision without any argument, or narrative.
- (2) Every such memorandum of appeal shall be accompanied by a treasury receipt for a sum of Rs.100/-/
- (3) Every such memorandum of appeal may be presented either in person or through an agent duly authorized in writing in this behalf by the appellant or may be sent by the registered post.

### **IX. Seed Analyst and Seed Inspectors**

The specific qualifications and duties of seed analyst and seed inspectors have been provided in this section.

#### **Qualifications of Seed Analyst.**

A person shall not be qualified for appointment as Seed Analyst unless he-



- (i) possesses a Master's or equivalent degree in Agriculture or Agronomy or Botany or Horticulture of a University recognized for this purpose by the Government and has had not less than one year's experience in seed technology; or
- (ii) possesses a Bachelor's degree in Agriculture or Botany of a University recognized for this purpose by the Government and has had not less than three years' experience in seed technology.

#### **Duties of a Seed Analyst.**

On receipt of a sample for analysis the Seed Analyst shall first ascertain that the mark and the seal or fastening as provided in clause (b) of sub-section (1) of section 15 are intact and shall note the condition of the seals thereon.

- (1) The Seed Analyst shall analyze the samples according to the provisions of the act and rules.
- (2) The Seed Analyst shall deliver the copy of the report of the result of the analysis to the persons specified in sub-section (1) of section 16.
- (3) The Seed Analyst shall from time to time forward to the State Government the reports giving the result of analytical work done by him.

#### **Qualifications of Seed Inspectors.**

A person shall not be qualified for appointment as Seed Inspector unless he is a graduate in Agriculture of a University recognized for the purpose by the Government and has had not less than one years' experience in seed production, or seed develop mentor seed analysis or testing in a seed testing laboratory.

#### **Duties of a Seed Inspector.**

In addition to the duties specified by the Act the seed inspector shall -

- (a) Inspect as frequently as may be required by certification agency all places used for growing, storage or sale of any seed of any notified kind or variety;
- (b) Satisfy himself that the conditions of the certificates are being observed;
- (c) Procure and send for analysis, if necessary, samples of any seeds, which he has reason to suspect are being produced stocked or sold or exhibited for sale in contravention of the provisions of the Act or these rules;
- (d) Investigate any complaint, which may be made to him in writing in respect of any contravention of the provisions of the Act or these rules;
- (e) Maintain a record of all inspections made and action taken by him in the performance of his duties including the taking of samples and the seizure of stocks and submit copies of such record to the Director of Agriculture or the certification agency;
- (f) When so authorised by the State Government detain imported containers which he has reason to suspect contain seeds, import of which is prohibited except and in accordance with the provisions of the Act and these rules;
- (g) Institute prosecutions in respect of breaches of the Act and these rules; and

#### **X. Sealing, Dispatch and Analysis of Samples**

The details of sampling, labeling, manner of packing and sealing the samples as well as its dispatch to the seed analyst has been provided.

**Manner of taking Samples.** - Samples of any seed of any notified kind or variety for the purpose of analysis shall be taken in a clean dry container which shall be closed sufficiently tight to prevent leakage and entrance of moisture and shall be carefully sealed.

**Containers to be labeled and addressed.** – All containers containing samples for analysis shall be properly labeled and the parcels shall be properly addressed. The label on any sample of seed sent for analysis shall bear-

- (a) Serial number and name of the sender with official designation, if any;
- (c) Name of the person from whom the sample has been taken;
- (d) Date and place of taking the sample;
- (e) Kind or variety of the seed for analysis;
- (f) Nature and quantity of preservative, if any, added to the sample;

**Manner of Packing, Fastening and Sealing the Samples.** – All samples of seeds sent for analysis shall be packed, fastened and sealed in the following manner:

- (a) The stopper shall first be securely fastened so as to prevent leakage of the containers in transit.
- (b) The container shall then be completely wrapped in fairly strong thick paper. The ends of the paper shall be neatly folded in and affixed by means of gum or other adhesive.
- (c) The paper cover shall be further secured by means of strong twine or thread both above and across the container, and the twine or thread shall then be fastened on the paper cover by means of sealing wax on which there shall be at least four distinct and clear impressions of the seal of the sender, of which one shall be at the top of the packet, one at the bottom and the other two on the body of the packet. The knots of the twine or thread shall be covered by means of sealing wax bearing the impression of the seal of the sender.

**Form of Order.** – The order to be given in writing by the Seed Inspector under clause (c) of subsection (1) of section 14 shall be in Form III.

**Form of Receipt for Records.** – When a Seed Inspector seizes any record, register, document or any other material object under clause (d) of sub-section (1) of section 14, he shall issue a receipt in Form IV to the person concerned.

**Samples how to be sent to the Seed Analyst.** – The container of sample for analysis shall be sent to the Seed Analyst by registered post or by hand in a sealed packed enclosed together with a memorandum in Form V in an outer cover addressed to the Seed Analyst.

**Memorandum and Impression of seal to be sent separately.** – A copy of the memorandum and a specimen impression of the seal used to seal the packet shall be sent to the Seed Analyst separately by registered post or delivered to him or to any person authorized by him.

**Addition of Preservatives to Samples.** – Any person taking a sample of seed for the purpose of analysis under the Act may add a preservative as may be specified from time to time to the sample for the purpose of maintaining it in a condition suitable for analysis.

**Nature and Quantity of the Preservative to be noted on the Label.** – Whenever any preservative is added to a sample, the nature and quantity of the preservative added shall be clearly noted on the label to be affixed to the container.

**Analysis of the Sample.** – On receipt of the packet, it shall be opened either by the Seed Analyst or by an officer authorized in writing in that behalf by the Seed Analyst, who shall record the condition of the seal on the packet. Analysis of the sample shall be carried out at the State Seed Laboratory in accordance with the procedure laid down by the Central Government.

**Form of Notice.** – The notice to be given under clause (a) of sub-section (1) of section 15 to the person from whom the Seed Inspector intends to take sample shall be in Form VI.

**Form of Report.** – The report of the result of the analysis under sub-section (1) or sub-section (2) of section 16 shall be delivered or sent in Form VII.

**Fees.** – The fees payable in respect of the report from the Central Seed Laboratory under sub-section (2) of section 16 shall be Rs. 10/- per sample of the seed analyzed.

**Retaining of the Sample.** – The sample of any seed shall, under clause (c) of sub-section (2) of section 15, be retained under a cool, dry environment to eliminate the loss of viability and insect proof or rat proof container. The containers shall be dusted with suitable insecticides and the storage room fumigated to avoid infestation of samples by insects. The sample shall be packed in good quality containers of uniform shape and size before storage.

## **XI. Miscellaneous**

The need to maintain stock record of seeds and record of the sale of seed have been provided in this section.

**Records.** – A person carrying on the business referred to in section 7 shall maintain the following

records, namely: - (a) stock record of seed; (b) record of the sale of seeds;

**Form of Memorandum.** – The memorandum to be prepared under subsection (4) of section 14 shall be in Form VIII.

### ***The Seeds (amendment) Rules, 1973***

- Judicial powers of authority provided in seed rules under Appeal, has been omitted.
- Seed analyst shall analyze samples in accordance with the procedures laid down in the seed testing manual published by the ICAR.
- Amendment has been made by specifying the time period (maximum 30 days after receipt of the sample) within which the seed analyst should report the result.
- Amendment by empowering the state government to assign any duty to seed inspector has been made.

### ***The Seeds (amendment) Rules, 1974***

- Modified the seed rules by adding a clause on action to be taken by the seed inspector if a complaint is lodged with him as a result of crop failure.
- The amendment says that in cases of crop failure, the inspector shall investigate causes of failure by sending seed samples for detailed analysis.
- He shall also submit the report to the competent authority
- If the inspector comes to conclusion that failure of performance is due to low quality seed not meeting the minimum standards notified by the Central government he shall take proceedings against supplier.

### ***The Seeds (amendment) Rules, 1981***

A new rule added under the seed certification and has mentioned Indian Minimum Seed Certification Standards published by the Central Seed Committee to be referred for certification

- The amendment says certification agency shall ensure that the seed standards confirm to the minimum seed certification standards laid down in the manual known as Indian Minimum Seed Certification Standards published by the Central Seed Committee which is commonly called as Blue Book.

### ***The Seeds (amendment) Rules, 2014***

The central government amended the seed rule, 1968 in 2014 by considering the changes made in seed certification procedure. In this amendment following forms (I to VIII) and procedures were changed.

- Application for grant of certification by seed certification agency certificate
- Form of receipt of seizure of records
- Memorandum to seed analyst
- Notice of drawing sample

- Certificate of test and analysis by seed analyst
- Memorandum of drawing the seed sample

### **Casestudy-01**

The Delhi High Court

**Case No :** In Criminal Writ Petition No. 300/2000,

**Appellant :** Korra Srinivas Rao S/O

**Respondent:** State of Maharashtra & Ors

**Acts Referred:** The Seeds Act, 1966, The Trade And Merchandise Marks Act, 1958, The Indian Penal Code, Section 420 in The Indian Penal Code, Section 79 in The Trade Marks Act, 1999

#### **Challenge:**

The Seed Inspector lodged complaint at Akole Police Station in the district of Ahmednagar on 10-7-2000 that the seeds of onion of Sapal Light Red brand manufactured by the petitioners and sold by Shramik Krushi Seva Kendra, Akole, Bageshwar Krushi Seva, Akole and Ganesh Krushi Seva Kalas in Akole taluka to thirteen different farmers, did not give desired yield of onion. Thereby the petitioners committed offence punishable under Section 420 read with 34 of Indian Penal Code and Sections 6(a) and 7(b) of the Seeds Act. 7.

- Pursuant to the lodging of the said complaints, Police started investigation. In all these petitions, the said first information reports and consequential investigation by the Police are sought to be challenged mainly on the ground that none of the complaints disclose cognizable offence so as to empower the Police to investigate into the matter.
- The complaints do not disclose any offence either under any of the provisions of Indian Penal Code or under the provisions of the Trade and Merchandise Marks Act; that, the Seeds Inspector, instead of following the procedure laid down under the Seeds Act and the Rules made there under, and thereafter launch the proceedings in the Court. Criminal complaints were filed stating that seeds sold by the petitioners therein did not yield desired results by the farmers as such crime was registered for the offences under Section 420 r/w Section 34 of IPC and Sections 6(a) and 7(b) of the Seeds Act. The High Court held that criminal case cannot be registered by the police and quashed the same.
- In case an offence is disclosed under the Seeds Act had, in total violation of the provisions of the Seeds Act and the Rules, sought to take resort to the proceedings under various other Acts by approaching the Police authorities; that, in any case, once the offence is said to be disclosed under any of the provisions of the Seeds Act, there cannot be proceedings for such offence under the provisions of Indian Penal Code.

### **Casestudy-02**

The Rajasthan High Court

**Case No.:** Instant petition under Section 482, Cr.P.C., Date: 21-12-2006

**Appellant:** Shamsundar Agrawal

**Respondent:** State of Rajasthan & Anr

**Acts Referred:** The Seeds Act, 1966, The Trade And Merchandise Marks Act, 1958, The Indian Penal Code, Section 420 in The Indian Penal Code, Section 79 in The Trade Marks Act, 1999, Section 7(b). The Seeds Act, 1966., Sections 3/7, Essential Commodities Act

#### **Challenge:**

The petitioner is claiming relief on the ground that he is working as Deputy Managing Director of Mahyco Seeds Ltd., having its registered office in Mumbai. The company in which the petitioner is Deputy Managing Director is engaged in the business of production,

processing and marketing of high-quality seeds for the farming community of India since 1964.

- In the instant petition under Section 482, Cr.P.C. the petitioner seeks to challenge order dated 15-10-2003 passed by the Chief Judicial Magistrate, Rajsamand (for short, "trial Court" hereinafter) taking cognizance of offences under Section 7(b). The Seeds Act, 1966. read with Sections 3/7, Essential Commodities Act against the petitioner as well as order dated 18-11-2004 passed by the District and Sessions Judge, Rajsamand dismissing the revision-petition filed by the petitioner.
- The petitioner is claiming relief on the ground that he is working as Deputy Managing Director of Mahyco Seeds Ltd., having its registered office in Mumbai. The company in which the petitioner is Deputy Managing Director is engaged in the business of production, processing and marketing of high quality seeds for the farming community of India since 1964.
- Learned Counsel for the petitioner submitted that the company requested the complainant non-petitioner for getting the seeds' samples re-tested in the Central Seeds Testing Laboratory but the request was not considered and, in violation of the provisions of the Seeds Act, the learned trial Court took cognizance illegally against the petitioner it is submitted that the company has been supplying the seeds to the farmers all over India for years together but not a single complaint has been received, therefore, in such doubtful circumstances, cognizance of alleged offence taken by the trial Court is not justified and proper.

The contention of the learned Public Prosecutor cannot be accepted that being the Deputy Managing Director the petitioner was responsible for the conduct of the business, without there being any evidence on record. This is not the law. The terms of Section 21 of the Seeds Act are clear in meaning and require an enquiry to be made before fastening liability for prosecution for commission of an offence under the Act. Under Section 21, the person sought to be prosecuted for commission of alleged offence under the Act cannot be held vicarious and personal liability must be established before prosecution of such person. The provisions of Section 21 of the Seeds Act do not rivet around vicarious liability. The plain interpretation of the statute leaves no manner of doubt that the person sought to be prosecuted must himself be liable for commission or omission of an act.

### **Casestudy-03**

The High Court For The State of Telangana: At Hyderabad

**Case No.:** Criminal Petition No. 2172 Of 2021 Date:10-01-2023

**Appellant:** VudaNagesh& Others

**Respondent:** State of Telangana

#### **Acts Referred:**

Essential Commodities Act, 1955 – Section 3, Section 7, Section 14, Section 15, Indian Penal Code, 1860 – Section 34, Section 71, Section 272, Section 273, Section 279, Section 304A, Section 304II, Section 328, Section 337, Section 420, Section 467, Section 468, Section 469, Section 471, Section 475, Seeds Act, 1966 – Section 6(a), Section 25, Food and Safety Standards Act, 2006 – Section 26, Section 30 Code Of Criminal Procedure, 1973 – Section 173, Section 207, General Clauses Act, 1967 – Section 26

#### **Challenge:**

According to the charge sheet filed by the Police Shantinagar, a written complaint was filed by the Agricultural Officer stating that the brands namely 'Arunium' and 'Akshi' varieties of chilli crop seeds are of sub-standard genetic purity. The said seeds were sold by the petitioner's company, which is M/s. Monsanto Holdings Private Limited. The farmers were

made to believe through their authorized dealers that the seeds were of genuine quality and the farmers would be benefited. However, when the farmers have sowed and cultivated the said seeds which were of sub-standard quality, they did not yield any crop and all the farmers have incurred losses. Aggrieved by the said sub-standard quality of seeds, the farmers staged dharna on 19.10.2016

- In the said judgment, the Division Bench took notice of both the Enactments and observed that, without delving into the facts of the case whether the activity alleged falls within the ambit of Seeds Act 1966 or Section 3 r/w Section 7 of the Essential Commodities Act, it was left open to the concerned Court to decide regarding the prosecution under the enactment of Seeds (Control) Order 1983 or the Essential Commodities Act. The Karnataka High Court placing reliance on the judgment of High Court of Bombay in the case of Korra Srinivas Rao and others v. State of Maharashtra (supra), held that FIR cannot be registered under the provisions of IPC. However, action can be taken under the Seeds Act or the Trade and Merchandise Marks Act 1958. In respect of any spurious seeds, the same would fall within the provisions of the Seeds Act, 1966 and any prosecution can be only under the provisions of the Seeds Act and the Rules made there-under. The Police have no jurisdiction to conduct investigation.

Learned counsel for the petitioners relying on the aforesaid judgments argued that even assuming that the seeds which were sold were not of the genetic purity as claimed by the DNA lab, there cannot be any prosecution under Section 420 of IPC or the Essential Commodities Act. However, the prosecution, if any may be under the Seeds Act. The Seed Inspector is the person, according to the Seed Rules 1968, who can inspect any such complaint of spurious seeds and take necessary action. The offence by the petitioners, if any, would be under Section 19 of the Seeds Act. In the said circumstances, charge sheet has to be quashed. However the Trial Court can draw its own conclusions on the basis of evidence adduced by both the parties during trial, uninfluenced by the observations in the present order, which is decided at the threshold only on the basis of documents filed under section 207 CRPC. Accordingly, the Criminal Petition is dismissed. As a sequel thereto, miscellaneous petitions, if any, shall stand closed.

#### **Casestudy-04**

The Andhra Pradesh High Court

**Case No.:** 14356 of 2017 **Date:** 11-10-2017

**Appellant:** VudaNagesh& Others

**Respondent:** State of Telangana

**Acts Referred:** Seeds Act, 1966 – Section 6, Section 7, Section 6(a), Section 6(b)

#### **Challenges:**

The petitioners are carrying on their respective businesses in seeds under the Licenses issued by the competent authorities under the provisions of the Seeds Act, 1966 and the Rules framed there under and the Seeds Control Order, 1983. While so, on a complaint made by the farmers, show cause notices were issued stating that Chilli Seeds of variety JCH-802 of M/s. Jeeva Agri Genetics, Hyderabad, sold by the petitioners, were found to be substandard.

- Based on the said complaint and report, show cause notices were issued to the petitioners for cancellation of their Licenses, for which, they have submitted their reply. But the 3rd respondent, who is the licensing authority, having not satisfied with the reply submitted by the petitioners, cancelled the Licenses by a cryptic order dated 13.10.2016. Challenging the same, 14 distributors preferred appeals before the 2nd respondent, who in turn, dismissed the same by confirming the order passed by the 3rd respondent

- The petitioners submitted reply stating that they are not aware of the quality of the seeds as they procured seeds from the manufacturer-M/s. Jeeva Agri Genetics, Hyderabad, and therefore, they are not responsible for quality of those seeds
- Being not satisfied with the said reply, the licensing authority cancelled the Licenses under the provisions of Clause 15 of Seeds (Control) Order, 1983 for contravention of Sections 6, 7 of Seeds Act, 1966 read with Clause 8(a) of Seeds (Control) Order, 1983.
- In a case where the dealer sells sub-standard quality of seeds, appropriate action can be taken by the departments at the initial stage itself, but if the authorities are not in a position to decide whether the seed sold is of sub-standard variety or not, appropriate provision for taking action on a complaint lodged by the farmers, who utilized the seeds, is Rule 23-A of the Rules. Rule 23-A reads as under: Action to be taken by the Seed Inspector if a complaint is lodged with him/rather than the District Level Committee

In the circumstances, all the writ petitions are allowed by setting aside the impugned orders of cancellation of Licenses. However, the authorities under the Seeds Act and the Seeds Control Order shall take appropriate steps for educating the farmers with regard to the future losses in case of spurious seeds. They shall also inspect the shops of the dealers periodically in order to prevent utilization of such spurious seeds by the farmers, resulting in huge loss to them. However, this order will not prevent the farmers from claiming compensation against the manufacturers and distributors, if any, in separate proceedings.

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# Varietal Release and Notification System in India

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## Introduction

Agriculture is the back bone of India and improved agricultural process mainly depends on use of newly evolved improved varieties. In Indian scenario a statutory varietal release system is working where notification and denotification process are playing a crucial role in quality regulation of seed. Crop research institutes like ICAR, SAUs and private seed companies are main pillars to develop varieties in India. The thumb rule is, the improved varieties must have quality to produce higher yield over to national check, state check and local check too. This is ensured via several multilocal tests.

In India almost 65 percent of the Indian population depends on agriculture and its allied sectors to obtain employment and sustain livelihood. The seed is considered as a basic and key input in agriculture. High-quality seed production was the major concern in the Indian subcontinent till the 1960s. In order to meet the food and nutritional demand of population and to become self-reliant in food grain production, Indian Government established All India Coordinated Crop Research Projects (AICCRPs) to produce a large number of varieties with assured seed quality in all major crops.

The production of high-quality seeds was one of the pillars to change the position of Indian agriculture into the new world order. The ultimate intention was to introduce the newly evolved high yielding cultivars to the resource-poor farmers for broad-spectrum cultivation in the area of their adoption.

Under such circumstances the Government of India acknowledged seed an essential commodity under the Essential Commodities Act, 1955. On October 1964, Varietal Release System (VRS) came into existence with the formation of the Central Variety Release Committee (CVRC) at the national level, and State Variety Release Committees (SVRCs) at each state level. A Central Seed Committee (CSC) a statutory body was established under the Ministry of Agriculture, Cooperation and Farmers Welfare provided in the Seeds Act, 1966.

The functions of the CVRC were taken over by the CSC in 1969 to ensure the quality of seeds on sale and notification of the varieties. To perform the function at central level to release/notification, provisional notification and de-notification of cultivars, CSC constituted a Central Sub-Committee on Crop Standards, Notification & Release of Varieties for both Agricultural and Horticultural Crops, while to perform similar functions at state level, State Seed Sub-Committee (SSSC) was constituted.

## Procedure of New Plant Genetic Material Development

Entries (pure lines/open pollinated varieties/composites/synthetics/hybrids etc.) are developed by the concerned plant breeders/agencies through breeding programs for the benefit of humankind. Different conventional (Introduction, selection, hybridization mutation & polyploidy followed by selection etc.) and advanced (tissue culture-based techniques like somaclonal variation, anther and pollen culture, marker assisted breeding, transgenic or genome editing techniques) breeding methods are being used by the different agencies to generate elite material for high yield potential, nutritional quality and other associated traits. Developed elite materials are being tested by the concerned plant breeder/s at their research station for three to four years in replications for stability and selected superior cultivars enter into the All India coordinated crop improvement projects (AICCIPs) trials for further testing in multi-environments across the country.

## **Crop Improvement projects system of variatal Testing through All India Coordinated Trails**

First AICCIP was started in way back of 1957 by ICAR on maize crop for systemic testing of entries and for release of high yielding new maize varieties. In general, the three-tier system (IVT-AVTI-AVTII) of multi-location evaluation is used for three years except perennial fodder crops (requires four years-one for crop establishment and three for evaluation) in India. Multi locational trials are conducted by the Project Coordinator (PC)/ Project Director (PD) of AICCIPs with the help of concerned principle investigators. All AICCIP trials are well organized, systemic and conducted through a uniform testing procedure across the centers as per crop standard. It is a powerful system to screen large number of entries and recommend well-tested, superior, and adapted new cultivars to the end users.

### **Essential Parameters of a entry for Testing under AICCIP**

1. Station trial or preliminary yield trial-Concerned plant breeder must perform station or regional trial and proposed entry must have undergone censorious evaluation process or screening (insect pests and diseases). Crop based quality parameters and tolerance to key abiotic stresses are also to be screened as per the requirement. Pre-coordinated trial data on yield, trait stability and other related agronomic traits must be available to the PC/PD in support of the relevance of entry.
2. The entry must have a high degree of genotypic stability, phenotypic uniformity, germination percentage and physical purity (as per the minimum seed certification standards).
3. The entry must have few distinct diagnostic traits which make it different to all remaining varieties. These distinct traits help to identification of variety during legal infringement (DUS testing).
4. All the information related to the development of entry *i.e.* parentage or pedigree should be available to the PC/PD by the concerned plant breeder/ agency. If the performance of entries are same in the coordinated trials, then preference will be given to the variety which has been developed by the using of diverse parents in breeding program.
5. Private companies can enter their material into the coordinated trial system as similar to other agencies but have to pay the prescribed fee for their entries as per guideline of the Government of India.

### **Prevailing Testing System(AICCP)**

The AICCIP centers for various crops are located at ICAR institutes or State Agricultural Universities (SAUs) or other volunteer centers recommended by AICCIP workshop based on covered crop area, adaptability, and agro-climatic condition etc. Following steps are involved.

### **Initial Varietal trial (IVT)**

The time duration of the initial varietal trial (IVT) is one year. All the entries, which were superior to their respective station trials, would be introduced into the IVT. These entries would be used for multi-location trials along with checks. In general, three checks (national, zonal and local checks) are being used for efficient evaluation of entries across the centers. These checks cannot be replaced after the IVT. Maintenance of genetic purity, germination and physical purity of new material are the prime objectives of the concern plant breeder/agency. The IVT trials are conducted in such a manner that minimum difference of yield (5–10%) and other ancillary traits can be measured. The cultural practice(seed rate, date

of sowing, row to row and plant to plant spacing; weed, fertilizer and water management etc) shall be strictly followed by the IVT centers as per guideline of PC/ PD.

The plot size of IVT is smaller than advanced trials. An IVT includes the maximum number of locations across the country to evaluate varietal adaptation and performance. A team of scientists (plant breeder, agronomist, pathologist, entomologists etc.) will monitor all the trials as per the recommendation of the PC. Each member of monitoring team submits their report to the PC based on their observation during trial monitoring. Entries which are superior over the best check in terms of yield and other related traits will be promoted into the advance varietal trial-I. The superiority is primarily decided based on yield potential and other related important traits such as quality traits.

### **Advance varietal trial-I (AVT-I)**

Based on superiority (5–10%) over the best performing check, superior entries will enter into the AVT-I from IVT. The number of tested entries in the AVT-I will be less than IVT. The plot size is large in AVT-I as compared to IVT, therefore data generated on yield and other ancillary traits will be more realistic, accurate and minimal chances of error. The number of testing locations should be more as compare to IVT in a given zone. During AVT-I, additional data on disease and or insect pest tolerance under artificial epiphytotic condition must be generated by the experts. Based on the performance of entry over the best performing check-in the respective zone, the superior entries would enter into the AVT-II.

### **Advance varietal trial-II (AVT-II)**

All the requirements shall be fulfilled as similar to AVT-I. However, few additional data will be generated at AVT-II stage *i.e.* response of entries to different dates of sowing, seed rate, spacing between plant to plant and row to row (population density), behavior in different level of fertilizer and irrigation by sponsored agronomists; response of diseases and pests by the plant pathologists, crop quality parameters by the biochemists. The seed technology center will develop descriptors which help in the seed certification process. All the processed and analyzed data on yield and other related traits, across the locations/centers (cooperating and volunteer) shall be submitted to the PC. On the basis of these data, annual reports are being made in each crop. All the data of superior entries are comprehensively discussed in the annual workshop/national group meetings by the PC/project director. After completion of the AVT-II, the concerned breeders are informed to submit varietal proposal based on the performance of their entries during three years of evaluation.

### **Procedure for Released and identification**

Based on three years performance, best performing test entries shall be identified in the annual group meet at the pre-defined institute/ university. The Zonal Coordinators and Principal Investigators attend the national group meet to provide wider aspects of information on the varieties. After the approval from Deputy Director General (Crop Science) of Indian Council of Agricultural Research (ICAR), a "Varietal Identification committee (VIC)" constituted in advance of national group meet. All the committee members (Table-1) shall be informed well in advance by the PC or PD. The VIC provides detailed information on recommended entries to the Central Sub-Committee on Crop Standards, Notification, and Release. This committee has sole right to release and notify the best-performing entry into national wise or zonal wise based on the recommendations of the VIC.

**Table-1 Varietal Identification Committee (VIC)**

<b>S.N. Representative</b>	<b>Organizational position</b>
1 DDG (Crop Science)/ his or her nominee	Chairman
2 Project Coordinator/Project Director of AICCIP	Member Secretary
3 Director of Research of institute/SAUs of that region where the meeting is held	Member
4 Agricultural Commissioner (Department of Agriculture)	Member
5 One nominee of Seed organization (NSC, SSC)	Member
6 One representative of private seed agencies	Member
7 One representative of crop-based industries	Member
8 Project coordinator (seed technology)	Member
9 Two eminent scientists of that institute	Member

### **Major criteria for identification of the variety**

1. The candidate variety must have a minimum of three years of yield and other ancillary trait data from multi-location coordinated trials.
2. At least two-year data on disease and pest reaction at a hot spot or artificial epiphytotic condition.
3. The candidate variety must have at least one-year data on agronomic performance like seed rate, dates of sowing, planting density, irrigation, and fertilization. In forage crops, three year rigorous evaluation must be done for annual crops (seed yield data for third year only) and four year for perennial crops (one year for crop establishment and other three years for evaluation).
4. The concerned breeder must have at least a minimum requirement of nucleus seed so that breeder seed can be generated easily.
5. The concerned plant breeder should have pure seed for planting of 5 ha area. If he or she did not match the requirement, then identification can only be postponed for one year.

### **Central sub-committee on crop standards, notification and release**

Central Sub-Committee on Crop Standards, Notification, and Release of Varieties appointed by Central Seed Committee under Section 3 of the seed act, 1966 during 1994. The committee comprised one chairman and 17 members (Table-2). Central Sub-Committee releases varieties as per the benefit of the stake-holders and need of regional, zonal or national importance, and the State Seed Sub-Committee releases varieties beneficial for particular state. Notification of variety is compulsory on regulating the seed quality under the provision of Seed Act, 1966. Notification usually authorizes certified seed production throughout the country, by private or public seed multiplication organizations. Once the Central Sub-

Committee accepts the proposal, the varieties will be released for the concerned agro-climatic zone/s (may cover one or more number of states or nation- ally). Simultaneously, it must be notified for seed certification purpose in the country. During the release, the concerned breeder must have a minimum amount of seed which can be sown at least ten-hectare area. Later on, seed multiplication is the responsibility of various seed agencies (NSC, SSC, private seed companies and progressive farmers, etc.).

**Table-2 Central Sub Committee**

S.N.	Representative	Organizaonal
1	Deputy Director General (Crop Sciences), ICAR	Chairman
2	Deputy Commissioner (QC) DAC & FW, GOI	Member Secretary
3	Directors of State Seed Certification Agencies, or their representatives	Member
4	Project Directors of Departments of Agriculture of all states, or their representatives	Member
5	Project Coordinators/Directors of AICCIPs	Member
6	Agricultural Commissioner, GOI	Member
7	Representatives of the seed industry, NSC, State Seed Corporations, Member private seed companies	Member
8	Representatives of ICAR, ICAR institutes, NGOs	Member
9	Progressive farmers	Member

### Difference between released and notified varieties

	Released variety	Notified variety
1	It is not a statutory function under the Seed Act, 1966	Statutory function and variety will be registered under Section 5 of seed act 1966.
2	It cannot be used for seed certification	Only notified varieties to come under seed certification
3	No guarantee on seed quality for farmers	Only notified varieties to come under seed certification
4	Seed law enforcement agencies (seed inspector etc.) cannot draw and test seed samples	They have the right to draw and test seed samples
5	These are not assets of Govt. of India	They have the right to draw and test seed samples
6	Its main purpose is to make available the information of cultivar to the public and its area of adoption	The main purpose is seed quality regulation
7	Difficult to trace out the genesis	The notification of the varieties will help to trace out its genesis

### Central seed committee (CSC)

It is a legal body constituted by the Department of Agriculture, Cooperation and Farmers' Welfare (DAC&FW), Ministry of Agriculture and Farmers' Welfare (MoA & FW), Government of India to advise central and state government on matters related to the implementation of seed act, 1966 and other related functions

Central seed committee (CSC )		
S.N.	Representative	Organizational
1	Secretary, DAC&FW, MoA & FW, GOI	Chairman
2	Additional Secretary (In charge Seeds), MoA& FW, GOI	Member
3	Agricultural Commissioner, MoA & FW, GOI	Member
4	Deputy Director General (Crop Sciences), ICAR	Member
5	Joint Secretary (In charge Seeds), MoA & FW, GOI	Member
6	Progressive farmers/ seed growers (4) nominated by the Member Central Government	
7	One representative from each State Govt.	Member
8	Director of National Seeds Project, MoA& FW, GOI	Member Secretary

### Major Empowerment of Central seed committee

- The CSC has authority to release varieties (pure lines/hybrids/composites/synthetics) developed by central research institutes (ICAR/non-ICAR), AICCIPs, private or corporate sector, and other organization as per the scientific data authenticity for zonal basis (which may include more than one state) or at national level.
- The CSC has authority to approve proposals received from the State Variety Release Committees/State Seed Sub-Committees for varieties developed by the State Research Institutes but is considered suitable for areas outside the state (based on their performance).

### State seed-sub committee

The State Seed Sub-Committees are constituted by Central Seed Committee and are authorized to set up a State Seed Laboratory, State Seed Certification Agency (SSCA) and an Appeals Authority, and to appoint seed inspectors and seed analysts

### Empowerment of state seed sub committee

There are some rights which have been provided by the Central Seed Committee for proper functioning of seed chain in respective state in India. These empowerments are-

- The State Seed Sub Committee will advise the state government on all matters related to the execution of the Seeds Act, 1966.
- Planning for different crop varieties to be grown in different regions of the state, and to review the assessment of seed requirements.

- Considering the release of new varieties for the state and recommend their notification to the Central Seed Committee.

### **Need of notification**

Since only notified varieties will be under the purview of Seed Law Enforcement, hence it is necessary to bring the seed of a particular crop variety under notification system. The seed inspector can only draw a sample from notified variety for analysis and ensure the seed quality. A released variety cannot come under seed chain without notification by the Gazette of India. The notification is made by the Central Government on the recommendation of the Central Seed Committee. Thus, notification is prerequisite for production of certified seed which ensures high quality of seeds to the farmers. The breeder seed can only be produced after the notification of variety and notified varieties enter into seed chain

### **De-notification of varieties**

Released varieties can be de-notified if they are not performing well in the area of their adoption or have been in cultivation for more than 15 years or are not much in demand. De-notification can be done based on the recommendation of central seed committee by the government of India.

### **Conclusion**

There are several ways and means to increase the crop production and productivity, however using genetically pure and high-quality seed is first and prime objective in agriculture. Therefore the variety which will be used by farmers must have undergone several evaluations in order to ensure its stable yield potential, tolerance to biotic and abiotic stresses and these criteria are being fulfilled by a legal varietal release system. The main objective of the varietal release system in India is to introduce newly developed, high yielding varieties to the farmers for broad-spectrum cultivation in the area of their adoption and only those varieties will be notified which are superior to existing one.

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## Seed Regulatory Mechanism in India

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Seed is the basic input for agriculture as the Manu Smriti said "*Subeejam Sukshetre Jayate Sampadyate*" which means Good Seed in Good Soil Yield Abundant. Hence the seed quality is the very important aspects it can be maintained during the production, processing, storage and marketing. The scientific seed production was started in India after the launch of AICRP Scheme on Maize in 1957. During early 1960's large number of hybrids was released in field and horticulture crops as a result the public sector organization (NSC) and some private sector started investment in seed industry. Government passed the Seed Act on 29<sup>th</sup> December, 1966, The seed (control) order 1983. The introduction of new policy on seed development (1988), a reform that led to significant change in the structure and regulation of the country's seed industry.

The major re-structuring of seed industry by the Government of India was done through the National Seed Project, which strengthened the seed infrastructure that was needed and relevant around those days. The seed (control) order 1983 was made to regulate quality of seed in market and storage through the appointment of seed controller and seed inspector from the state government. The introduction of new policy on seed development (1988) is another significant milestone in Indian seed industry. In recent years in order to provide for the establishment of an effective system for the Protection of Plant Varieties, Rights of Plant Breeders, Researchers and Farmers was covered under PPV and FR Act, 2001, in line with the TRIPS guidelines, the government passed the Protection of Plant Varieties and Farmers' Rights Act (PPV&FR Act). The Biological Diversity Act, 2002 and The Biological Diversity Rules, 2004. The National Seeds Policy of 2002 aimed at a regulatory framework for access to quality seeds through vibrant and responsible seed industry.

The New Industrial Policy of 1991 further relaxed restrictions over India's seed industry by permitting foreign direct investment and technology transfers, while the Export and Import Policy of 2002-2007 lifted the restrictions on exports of all cultivated (other than wild varieties) seeds except for jute and onion. During the last four to five decades the seed production technologies have changed and new technologies like Ht (hybrid technology), Bt (transgenic), tissue culture and nano technology had emerged. Based on these changes the existing seed act, 1966 is needs to be replaced by New Seed Bill 2004.

The Government of India had taken a decision to frame the Cotton Price (Control) order, 2015 which gave GM technologies a great relief to cotton stake holders such as seed companies, technology provider and above all farming communities by ensuring uniform regulation, of the sale price of cotton seed with the existing and future varieties or hybrids across India.

It is difficult for almost all the small seed companies and few medium companies to survive in this technology driven competitive environment, Sourcing of technology costs

small and many medium sized companies which they can't not afford therefore they may like to be acquired by large companies or new seed players like multinational companies.

- Quality Seed production and assurance
- Seed price controls
- Inefficient market and price regulation
- Low investments in public sector research
- Seed standards Regulation
- Seed price lower than grain / crop price
- IPR Compliance with research and development
- Technologies for climate change adaptation
- Strengthening infrastructure & capacity building

### **Reforms in Indian Seed Legislations**

- Essential Commodity Act ,1955
- Seeds Act, 1966
- Seeds Rules, 1968
- The Seeds (Amendment) Rules, 1973, 1974, 1981, 2014
- Seeds (Control) Order, 1983
- Environment (Protection) Act, 1986
- New Policy In Seed Development 1988
- The Seeds Bill, 2004
- AP Cotton Seeds Act, 2007
- AP Cotton Seeds Rules 2007
- Central Seed Bill, 2004
- Protection Of Plant Varieties And Farmers' Rights Act (2001)

### **Seed Act-1966**

The parliament had passed Seed Act, 1966 to provide legal framework for seed certification and to make quality seeds available to farmers. The Seed Act 1966 made provision to frame seed rule 1968 and which was notified by Government of India. The systematic seed certification programme was started in India from 1969 once the act was implemented throughout the country on 2<sup>nd</sup> Oct 1969. This act helps in the establishment of apex organizations like central seed committee for advising the state and central government on all matter related to seed, central seed certification board to advise all the state seed certification agencies and it also provided the establishment of central and state seed testing laboratories for testing of seed quality. The central government has fixed the standards for certification and standards for labeling by notification. The certification standards cover overall aspects including genetic purity, physical purity, germination and disease infection etc. under The Seed Act 1966.

### ***Important sections of Seed Act 1966***

- Establishment of central seed committee (Section-3)
- Establishment of central and state seed testing laboratories (Section-4)
- Notification of kind and varieties (Section-5)
- Fixation of minimum limits of germination and pure seed (Section-6)
- Constitution of seed certification agencies (Section-8)
- Appointment of a seed analyst (Section-12)
- Appointment of seed inspector (Section-13)

- Penalty or punishment for those who not comply the any provision of steps act (Section-19)
- Power to make rules. (Section-25)

The Seed Act, 1966 and its rules 1968 was amended as and when required for quality seed production, regulation and marketing.

#### **SALIENT FEATURES OF SEEDS ACT, 1966 & SEEDS RULES, 1968**

- Seeds Act, 1966 is an Act containing 25 sections and 8 statutory forms numbered from I to VIII.
- Seeds Rules, 1968 contain 39 Rules
- Applicable only to seed of notified kinds and varieties
- Certification is voluntary
- Punishment is ineffective
- Licensing of dealer is not dealt
- Compulsory packing, sealing and labeling in a prescribed manner
- Meeting of prescribed standards of germination and purity

#### **DUTIES OF SEED INSPECTOR (As per Rule 23 of Seeds Rules, 1968)**

- Inspect as frequently as may be required all the places used for Storage or Sale of seed of any kind and varieties.
- Satisfy himself that the conditions of the tag/label are being observed.
- Procure and send sample of seed of any kind and variety for analysis if necessary.
- Investigate any complaint which may be made to him in writing.
- Maintain the records of all inspections and actions taken by him.
- Detain seed stock on suspicion and institute prosecution in respect of breach of the Act.

#### **POWERS OF SEED INSPECTOR (As per Section 14 of Seeds Act, 1966)**

- Perform other duties as may be entrusted to him by Government
- To take samples of any kind and varieties from any person selling such seed or purchaser or consignee.
- To enter and search all reasonable time with such assistance
- To examine any record, register, document or any other material object and seize the same.
- To break open any container in which any seed of kind and varieties may be contained or to break open the door of any premises on refusal of custodian to open the door on being called upon to do so.

#### **FOLLOWUP ACTION- FOR SUBSTANDARD SAMPLE**

- Serve Form VII to dealer followed by seizure of stock/records and obtain custody orders from magistrate
- Issue show cause notice to the defaulter viz, dealer /distributor/ producer as per the discretion of Prosecuting Officer ie, Assistant Director of Agriculture under whose jurisdiction the defaulters premises is located.
- Refer the matter to the Public Prosecutor along with all specimen evidences viz, Form No. III, IV, V, VI, VII, VIII and copy of Panchanama, copy of explanation called for, reply thereof and copy of the labels and tags, Magistrate orders for safe custody of material and records collected in the course of inspection.
- On receipt of opinion from Public Prosecutor the Prosecuting officer shall seek the permission of Commissioner of Agriculture ([Prosecution proposals](#)) for instituting prosecution against the defaulter

- Limitation period (Stipulated period within which the case has to be filed in the court): 6 months from date of receipt of analysis report

### **REFEREE SAMPLE ANALYSIS OPTION FOR SAMPLE DECLARED SUBSTANDARD BY STL**

As per Section 16 (2)(b) of Seeds Act, 1966

- It is an option of the dealer/producer/complainant by making an application to the Court after institution of prosecution
- Payment of fee by applicant of Rs 10/- in the form of demand draft in favor of "Pay and Accounts Officer (Secretary), Ministry of Agriculture, DAC" payable at New Delhi and addressed to the Director, National Seed Research & Training Centre (CSTL), GT Road, Collectry Farm, PO Industrial Estate, Varanasi - 221106 (UP) Ph. No. 0542-2370222
- Court selects one of the samples of guard/dealer/half of submitted sample sent back by seed analyst and dispatches sample under its seal to the above referral lab.
- Analysis report within 30 days from CSTL and it supercedes STLs report

### **PRECAUTIONS TO AVOID FAILURE OF PROSECUTION**

Drawal of sample by prescribed sampling instrument.

- Adopting prescribed sampling intensity as given in Schedule I of Seeds (Control) Order, 1983.
- Adopting prescribed procedure of packing and dispatch as envisaged in Rule 26 & 29 of Seeds Rules, 1968.
- Regular attendance at Court.
- Proper replies in chief/cross/re-examination
- Conducting of Panchanama.
- Serving of Form-VII ie, analytical report to the dealer.
- Calculation of limitation period, which commences from the date of acknowledgment of Form-VII.

### **PRECAUTIONS TO AVOID FAILURE OF PROSECUTION**

Maintenance and production of all specimens in the court:

- a) Form-III, IV, V, VI, VII, VIII, Cash receipt
- b) Guard sample
- c) Consent of Commissioner.
- d) Copies of show cause replies.
- e) Permission of magistrate for order of safe custody.
- f) Production of witnesses.
  - Keeping the seized stock under combined seal of seed inspector and dealer.
  - Drawing the seed sample from the seized stock prior to shifting of stock to safe custody.

### The Agriculture Department and The Police Department Shall Take Action For Controlling Spurious Seeds

S. No.	Particulars	Action that can be taken by Agricultural Department		Action that can be taken by the Police Department	
		Contravention	Punishment	Contravention	Punishment
1	Selling of substandard seed of any crop i.e., mixture of other variety seed, less standard than prescribed (a) Less Genetic Purity (b) Less Physical purity (c) Less Germination (d) Less Bt protein in case of cotton seed.	Section 7 of Seeds Act, Clause 8 A of Seeds (Control) Order, 1983	Section 19 of Seeds Act, 1966 First offence: Rs. 500/- fine	Clause 8 A of Seeds (Control) Order, 1983	Section 7 of Essential Commodities Act 1955. Imprisonment upto 7 years (bailable)
2	Selling of date expired seed	Section 7 of Seeds Act, Clause 8 A of Seeds (Control) Order, 1983	Section 19 of Seeds Act, 1966 & 6 A Proceedings under EC Act 1955.	Dealer is selling expired stock having known that it is expired; hence it is a cheating activity. IPC 420 and Section 7 of EC Act 1955. (bailable, upto 7 years punishment)	
3	Selling of any / all types of seed without License/unauthorized	Clause 3 (1) of seeds (Control) Order, 1983	6 A proceedings under EC Act 1955	Clause 3 (1) of Seeds (Control) Order, 1983 and Section 7 of Essential Commodities Act 1955.	
4	Selling of seed by companies / dealers, with improper / incorrect labeling	Section 6(b) and 7(c) of Seeds Act, 1966	Section 19 of Seeds Act, 1966	IPC 487 (punishment with imprisonment for 3 years, bailable) IPC 420 (Punishment with imprisonment for 7 years , non-bailable)	
5	Misrepresentation / misleading statements on Label with exaggerative claims of yield etc.	Rule 10 of Seeds Rules 1968	Section 19 of Seeds Act, 1966	IPC 420, IPC 487, IPC 120 (B), Section 7 of EC Act 1955.	
6	Labeling of imaginary names of product without there being such authorized name and such variety of seed containing unauthorized seed.			Punishable under sections 420,468,471,487 of IPC.	

7	Selling of loose seed, torn out containers in case of cotton	Section 7 of Seeds Act 1966	Section 19 of Seeds Act, 1966	Contravention of Rule 13 of EP Rules 1989, punishable under Section 15 (1) of Environmental Protection Act, 1986 only on the written complaint of Seed inspector.
8	Business of fly-by-night operators	Detention order by District Collector on recommendation of JD Agriculture.	IPC 420, IPC 487, IPC 120 (B), Section 7 of EC Act 1955.	
9	Selling of cotton seed at more price than fixed by the Government of AP	Section 11 of the AP Cotton Seeds Act, 2007 in case of cotton seeds	Section 12 of the AP Cotton seeds Act 2007	
10	Possessing empty seed pouches with fake labelling			Section 420 IPC, 487 IPC, read with 120 (B) IPC
11	Storing or offering to sale or selling or transporting illegal Bt cotton seed.	Rule 7 of EP Rules, 1989 read with	Section 15 (1) of Environmental Protection Act, 1986. Complaint has to be filed before Police by the Seed Inspector.	IPC 420, IPC 487, IPC 120 (B)& IPC 468 police need to register the case on the complaint of the seed Inspector and remand the accused based on such complaint
12	Diversion of subsidy seed			409 IPC

### ***The Seeds (amendment) Rules, 1973***

- Judicial powers of authority provided in seed rules under Appeal, has been omitted.
- Seed analyst shall analyze samples in accordance with the procedures laid down in the seed testing manual published by the ICAR.
- Amendment has been made by specifying the time period (maximum 30 days after receipt of the sample) within which the seed analyst should report the result.
- Amendment by empowering the state government to assign any duty to seed inspector has been made.

### ***The Seeds (amendment) Rules, 1974***

- Modified the seed rules by adding a clause on action to be taken by the seed inspector if a complaint is lodged with him as a result of crop failure.
- The amendment says that in cases of crop failure, the inspector shall investigate causes of failure by sending seed samples for detailed analysis.
- He shall also submit the report to the competent authority
- If the inspector comes to conclusion that failure of performance is due to low quality seed not meeting the minimum standards notified by the Central government he shall take proceedings against supplier.

### ***The Seeds (amendment) Rules, 1981***

A new rule added under the seed certification and has mentioned Indian Minimum Seed Certification Standards published by the Central Seed Committee to be referred for certification

- The amendment says certification agency shall ensure that the seed standards confirm to the minimum seed certification standards laid down in the manual known as Indian Minimum Seed Certification Standards published by the Central Seed Committee which is commonly called as Blue Book.

### ***The Seeds (amendment) Rules, 2014***

The central government amended the seed rule, 1968 in 2014 by considering the changes made in seed certification procedure. In this amendment following forms (I to VIII) and procedures were changed.

- Application for grant of certification by seed certification agency certificate
- Form of receipt of seizure of records
- Memorandum to seed analyst
- Notice of drawing sample
- Certificate of test and analysis by seed analyst
- Memorandum of drawing the seed sample

### **Seed (Control) Order- 1983**

The seed (Control) order 1983 was made by the provision of section-3 of the essential commodity Act, 1955 by considering seed is an essential commodity for all the farming community.

The main aim of this order is to monitor the quality of seed during marketing. The seed producing and marketing companies are operating by obtaining the license under the order. Following are the important requirement for seed dealers made under Seed (Control) Order-1983.

- Dealer should display stock and price list (Clause 8).
- Dealer should ensure that the quality of seeds claimed by him as per section-6 of seed act-1966.
- Dealer should give cash or credit memo to purchased seed.

### ***Important features:-***

- Appointment of seed controller for regulating the quality of seed and sale of seeds.
- Appointment of seed inspector.
- Suspension/ cancellation of seed license by competent authority.
- Maintenance of record and its submission on periodical basis.

### ***Following forms are prescribed under Seeds (Control) Order, 1983:***

- Form-A : Form of application to obtain dealers license (Clause 4)
- Form-B : License to carry on business of a dealer in seeds (Clause 5)

- Form-C: Application for renewal of license to carry on business of a dealer in seeds (Clause 7)
- Form-D: Format for monthly return (Clause 18)

### **New policy in Seed development 1988**

The liberalized and privatized era in Indian Seed Industry was brought out with the New Policy on Seed development by the Ministry of Agriculture vide letter No-11-71/88-SD-1 dated 16, Sept. 1988. The main aim of this policy is to provide the farmer the best available seeds and planting material in the world so as to increase the farm productivity and their by increase the income and export earnings. This policy covers the import of seeds of coarse cereals, pulses, oil seed, vegetable and flowers, bulbs cutting sapling etc.

#### ***Procedure for import of seeds of coarse cereals/pulses/oil seeds***

- The import of seeds of coarse cereals/pulses/oil seeds is permitted for a period not exceeding two years by companies that have technical/financial collaboration with companies abroad.
- The bulk import is permitted by the importer based on the recommendation issued by the Department of Agriculture & Cooperation (DAC) after considering the trial/evaluation report of the varieties/hybrids.
- Plant Protection Advisor (PPA) or any other officer notified for the said purpose issues the import permit based on the recommendation of DAC.
- The quantities of the seed permitted to import for initial trials by the importer, for ICAR multi-location trials & agronomic trials or combined trials.
- The quantities of seeds of parental lines required to be sampled and submitted in sealed condition for accession to gene bank of National Bureau of Plant Genetic Resources (NBPGR), New Delhi.
- The imported consignment shall be subjected to detailed testing for a period of 30-35 days

### **THE ENVIRONMENT (PROTECTION) ACT No. 29 of 1986**

An act to provide for the protection & improvement of Environment and for matters connected therewith

- Date of Implementation: 23<sup>rd</sup> May 1986
- There are 24 Sections under this Act.
- The important Sections which relate to the Seed Legislation on GMOs:
- Section 10: Notification of Seed Inspectors & Powers to inspect, search, seize the GMOs are given. The AOs are notified as Seed Inspectors vide GSR 584 (E), Dt: 1-9-06
- Section 11: Drawal of samples by issuing notice in Form I (under EPA Rules 1986) and can refer for analysis to Notified labs vide Form II (under EPA Rules 1986).
- Section 13: Role of Seed Analyst and Method of Analysis. The Seed Analyst report is communicated in Form III (under EPA Rules 1986)
- Code of Criminal Procedure 1973 is applicable for search and seizure.

### **Protection of Plant Varieties and Farmers' Rights Act (2001)**

The protection of plant varieties become mandatory when India became signatory to Trade Related aspects of Intellectual Property Right (TRIPS). A legislation is required to be formulate under the "article 27.3" requires the TRIPS member countries to provide protection of plant varieties either by patent act, UPOV act or by effective *sui generis* system or by combining of thereof. The Government of India enacted "The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001" adopting *sui generis* system in order to provide for the establishment of an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants



### ***Objectives***

- To establish an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants.
- To recognize and protect the rights of farmers in respect of their contributions made at any time in conserving, improving and making available plant genetic resources for the development of new plant varieties.
- To accelerate agricultural development in the country, protect plant breeders' rights; stimulate investment for research and development both in public & private sector for the development of new plant varieties.
- Facilitate the growth of seed industry in the country which will ensure the availability of high quality seeds and planting material to the farmers

### ***General functions of the authority***

- Registration of new plant varieties, essentially derived varieties (EDV) and extant varieties
- Developing DUS (Distinctiveness, Uniformity and Stability) test guidelines
- Developing characterization and documentation of registered varieties
- Compulsory cataloging facilities for all variety of plants
- Documentation, indexing and cataloguing of farmers' varieties
- Recognizing and rewarding farmers, community of farmers, particularly tribal and rural community engaged in conservation, improvement, preservation of plant genetic resources of economic plants and their wild relatives
- Maintenance of the National Register of plant varieties and National Gene Bank

### **Rights under the Act**

#### **Breeders' Rights**

Breeders will have exclusive rights to produce, sell, market, distribute, import or export the protected variety. Breeder can appoint agent/ licensee and may exercise for civil remedy in case of infringement of rights.

#### **Researchers' Rights**

Researcher can use any of the registered variety under the act for conducting experiment or research. This includes the use of a variety as an initial source of variety for the purpose of developing another variety but repeated use needs prior permission of the registered breeder.

#### **Farmers' Rights**

- A farmer who has evolved or developed a new variety is entitled for registration and protection in like manner as a breeder of a variety.
- Farmer's variety can also be registered as an extant variety.
- A farmer can save, use, sow, re-sow, exchange, share or sell his farm produce including seed of a variety protected under the PPV&FR Act, 2001 in the same manner as he was entitled before the coming into force of this Act provided farmer shall not be entitled to sell as a branded seed of a variety protected under the PPV&FR Act, 2001.
- Farmers are eligible for recognition and rewards for the conservation of Plant Genetic Resources of land races and wild relatives of economic plants.
- There is also a provision for compensation to the farmers for non-performance of variety under Section 39 (2) of the Act, 2001.

- Farmer shall not be liable to pay any fee in any proceeding before the Authority or Registrar or the Tribunal or the High Court under the Act

### ***Benefit Sharing***

The benefit sharing is one of the most important ingredients of the farmers' rights. Section 26 provides benefits sharing and the claims can be submitted by the citizens of India or firms or non-governmental organization (NGOs) formed or established in India. Depending upon the extent and nature of the use of genetic material of the claimant in the development of the variety along with commercial utility and demand in the market of the variety, breeder will deposit the amount in the Gene Fund. The amount deposited will be paid to the claimant from National Gene Fund. The Authority also publishes the contents of the certificate in the PVJI (Plant Variety Journal) for the purpose of inviting claims for benefits sharing.

### **The Seeds Bill, 2004**

The seed sector has witnessed many changes since 1966, it includes new technologies such as GM seeds and economic liberalization policies has allowed foreign private seed companies to play much larger role in Indian seed industry than ever before, in order to address these changes a new seed bill (Seed Bill 2004) which was first time introduced in Rajya Sabha on 9<sup>th</sup> December, 2004. The proposed seed bill (2004) has been revised four times in the last 13<sup>th</sup> years mainly to accumulate the concerns expressed by farmer body, seed society and political parties. However, seed bill, 2011 version is still pending in the upper house of parliament.

### ***Important features of New Seed Bill***

- Compulsory registration of varieties. No person will be allowed to carry on the business of selling or supplying any seed which is not of a registered kind/variety. Farmers are to be exempted from compulsory registration. Registration will be for a fixed period but can be pre-maturely cancelled for stated reasons.
- Enhancement of penalties is proposed from Rs.500 / Rs.1000 with or without imprisonment in the Seeds Act 1966 to Rs.25,000/ Rs.5,00,000 with or without imprisonment.
- Provision for labeling of expected performance of seeds has been included so that the farmers are assured of quality of seeds purchased by them. Seed health has been added as an additional standard for quality seed.
- Provision for compensation to the farmer in case of seed failure has been made.
- The Bill proposes to emphasize the rights of the farmers in conformity with the Protection of Plant Varieties and Farmers' Rights Act, (PPV & FR Act) 2001. The farmer will have the right to grow, sow, re-sow, save, use, exchange, share or sell his farm seeds and planting materials except when he sells such seed or planting material under a brand name.
- The Government will have the right to exclude certain kind or variety of seeds from registration to protect public order or public morality or human, animal and plant health or to avoid serious prejudice to the environment.
- Provisions to regulate import and export of seeds have been largely incorporated
- GURT (Restriction technology including terminator technology) has been prohibited. Any person intending to import seed or planting material will declare that such material is, or is not, as the case may be a product of transgenic manipulation or involves Genetic Use Restriction Technology.

### **OECD Seed Certification Scheme**

The OECD Seed Schemes provide a framework for the certification of seeds in order to facilitate international trade. The framework is designed to reduce technical barriers, improve

transparency, and lower transaction costs. These schemes established in 1958 and have a current membership of 58 countries. Each country is represented by **National Designated Authorities (NDA)**. The Schemes are based on a set of rules, procedures and techniques that ensure the varietal identity and purity of seeds. The OECD Secretariat provides the **National Designated Authorities** with the instructions of the listing of varieties.

*There are seven Agriculture Seed Schemes in OECD*

- Grasses and Legumes
- Cereals
- Crucifers and other oil or fiber species
- Fodder beet and sugar beet
- Subterranean clover and similar species
- Maize and sorghum
- Vegetables

**Objectives**

- To provide an international framework for the certification of high quality seed
  - Harmonization of seed certification procedures in member countries
  - To facilitate seed trade & reduce non-tariff barriers
  - To encourage the use of consistently high-quality seed in participating countries
- To enhance co-operation and understanding between:
  - Importing and exporting countries
  - Public & private sector
  - Other international organizations (FAO, UPOV, ISF & ISTA)

Ministry of Agriculture, Government of India, submitted a formal application to the Secretary General of the OECD on 21<sup>st</sup> September, 2007 requesting membership of the OECD Seed Schemes. India's participation is accepted in the OECD Seed Schemes during October, 2008. In the application, the Ministry requested to participate in the following seed schemes:

- Cereal seed.
- Maize and sorghum seed.
- Vegetable seed.
- Grass and legume seed.
- Crucifer seed and other oil or fiber species seed.

**The Designated Authority of the Country of Registration is responsible for:**

- Ensuring that the variety to be OECD listed has been registered on the National Official Catalogue.
- Communicating the name of the person(s) or organization(s) responsible for the maintenance of the variety. Liaising with the maintainer of the variety.
- Providing written agreement for the multiplication of seed outside the Country of Registration to the appropriate Designated Authority.
- Supplying an authenticated standard sample of the variety to be multiplied in order that a control plot can be sown to provide an authentic reference of the variety.
- Supplying an official description of the variety to be multiplied. Authenticating the identity of the seed to be multiplied.

### Comparison of Stages of Seed Multiplication in OECD and Indian Certification System:

<i>Indian Certification System</i>	<i>OECD Certification System</i>
Nucleus Seed	Pre-Basic seed - white tag with a diagonal violet stripe
Breeder Seed: Golden yellow colour tag	Basic seed - White tag
Foundation Seed: White colourtag	Certified 1 <sup>st</sup> Generation - Blue Tag
Certified Seed : Azure Blue colour tag	Certified 2nd Generation, or subsequent generations - Red tag
Labelled Seed: Opal green colour	Not Finally Certified - Grey Tag -This is not to be used with the statement EC rules and standards

### The Cotton Seeds Price (Control) Order, 2015

Certain cotton growing states have been fixing the Maximum Sale Price (MSP) of Bt cotton seeds from 2008 onwards and have been specifying the trait value in the price notifications from 2010 onwards under their respect State Cotton Seeds Acts. Other states have also been regulating the Bt cotton seed prices through executive orders. Despite the lower trait value specified by State Governments, the technology provider has been collecting much higher trait value than what is specified. Cotton seed companies were caught in an unenviable situation due to collection of higher trait value by the technology provider than what is specified by the State Governments and cap on MSP.

Government of India has issued Cotton Seeds Price (Control) Order, 2015 under section 3 of the Essential Commodities Act, 1955. which gave GM technologies a great relief to cotton stake holders by ensuring uniform regulation, of the sale price of cotton seed with the existing and future varieties or hybrids across India.

#### *Salient features and important provisions:*

- **Clause 3:** Controller shall have the power to regulate the sale price of cotton seeds notified by the Central Government.
- **Clause 4:** Controller shall advise the Central Government on regulation of sale of cotton seeds at notified Maximum Sale Price (MSP), prescribe licensing guidelines and format for the GM technology licensing agreements and any other matter referred to him by Central Government for advice.
- **Clause 5:** Central Government on the recommendations of the Committee, shall fix the MSP, Seed Value and License Fee including royalty or trait value, if any. No licensor, licensee or dealer shall distribute and sell seed above MSP fixed by the Central Government.
- **Clause 6:** Any person aggrieved by any notification or order may apply to the Central Government or the specified authority for a review within a period of 30 days from the date of such notification or order.
- **Clause 7:** Contraventions of any of the provisions of this Order or any direction made there under is punishable under section 7 of the Essential Commodities Act.

#### **Reference:**

- PPV and FRA publication: Broacher no: PPVFRA/4
- The cotton seeds price (control) order, 2015, Seed news, Issue: Dec.-2015 (The national seed Association of India)
- The Seeds Bill, 2004, [agricoop.nic.in/imagedefault1/Seed%20 Bill.doc](http://agricoop.nic.in/imagedefault1/Seed%20Bill.doc)
- [www.plantauthority.gov.in](http://www.plantauthority.gov.in)
- [www.seednet.gov.in](http://www.seednet.gov.in)
- <http://www.gktoday.in/seed-act-1966>

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## Seed Law Enforcement In *B.t.* Cotton

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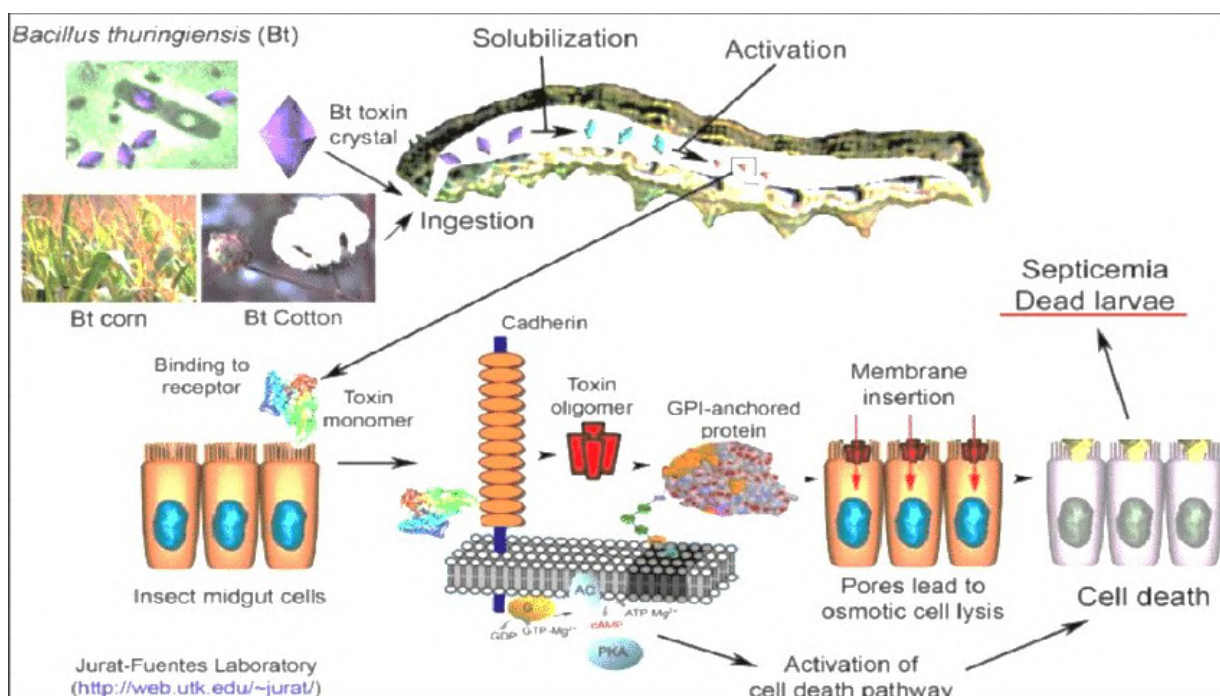
Cotton is one of the most important fibre crops in the world. It is cultivated in more than 100 countries contributing about 40% of the global market and having major share in global agriculture economy. The major producers of cotton are China, India, USA, Pakistan, Uzbekistan, Argentina, Australia, Greece, Brazil, Mexico, and Turkey; contribute about 85% to the global cotton production. In India, Cotton is cultivated in three distinct agro-ecological regions (north, central and south) of the country. The northern zone is almost totally irrigated, while the percentage of irrigated area is much lower in the central and southern zones. The lowest being in the central zone which has nearly 60% of cotton area of our country. India got 1<sup>st</sup> place in the world in cotton acreage with 120.55 lakh hectares area under cotton cultivation *i.e.* around 36% of world area of 331 lakh hectares. Around 67% of India's cotton is grown on rain-fed areas and 33% on irrigated area. In terms of productivity, India is on 40<sup>th</sup> rank with yield of 445 kg/ha (COCPC, 2022).

*Bt* Crops are transgenic crops that produce the same toxin as the bacterium *Bacillus thuringiensis* in the plant cell, thereby, *protecting* the crops from pests. When an insect feeds on the transgenic plants, the toxic "cry protein" present in the plants crystallizes the digestive system of insects, eventually leading to its death. *Bacillus thuringiensis* is a gram-positive, spore-forming bacteria which is mainly found in the soil. The organism *Bacillus thuringiensis* was discovered in 1911 as a pathogen in flour moth, Thuringia, Germany. But later it was commercially utilized as bio pesticides in France in 1938 and then in USA (1950) for the toxin produced by this bacterium. From 1950 onwards the bio pesticides containing this soil bacterium were popular.

### ***Bt* cotton and its mechanism:**

A few of the *Bt* crops include cotton, brinjal, corn, soybean etc. The *Bt* cotton variety is genetically transformed with the *Bt* gene to protect the plants from bollworm, a major pest of cotton. In 1992, the gene which is responsible for the toxin production was introduced to the cotton crop was grown in six locations in USA, produced by Monsanto. The aim of introducing *Bt* cotton to India was to reduce the amount of insecticide needed in cotton farming. The worms present on the leaves of *Bt* cotton become lethargic and sleepy and thus, cause less damage to the plants. When the caterpillar feeds on the *Bt* cotton plant, its digestive system is weakened, making it unable to feed and it eventually dies, but are harmless to other forms of life.

The *Bt* transgenic cotton (Bollgard of Monsanto) has thus been developed successfully in USA, which has the ability to control the bollworms at the early stages of crop growth (upto 90 days) effectively. The first commercial *Bt* cotton variety was released in USA by M/S. Monsanto (Bollgard), which contains Cry 1Ac gene of *Bacillus thuringiensis*.



### Development of Bt - Cotton- Worldwide

Year	Events
1996	The crop was economically grown in USA in 73000 ha
1997	Cultivated in China in 1 million ha
1998	Cultivation in 1.5 million ha (USA, Mexico, Australia, Argentina, China and South Africa)
2001	5 million farmers grown <i>Bt</i> -cotton in which 99% were in developed countries
2002	Commercialization of Monsanto's <i>Bt</i> -cotton was approved
2003	Area increased approximately to 100,000 hectares in India

### Development of Bt. Cotton in India

1995	Mahyco sent its application to Dept. of Biotechnology (DBT) seeking permission for introducing this technology.
1996	Mahyco received 100 gms of <i>Bt</i> -cotton seeds (variety Cocker 312) containing the Bollgard <i>Bt</i> gene Cry I A(c) from Monsanto, USA.
1996-2002	After testing the efficacy of this gene, these were used in breeding programmes and 40 elite Indian parental lines were introgressed with Cry I A(c) gene by crossing with <i>Bt</i> gene donar parent. Demonstration the safety and benefit of <i>Bt</i> cotton as per regulatory requirements.
2002-2003	Three <i>Bt</i> . Varieties namely, MECH 12, MECH 162 and MECH 184 were released commercially by Mahyco seed company. 3 % cotton area under <i>Bt</i> . Cotton.
2003- 2004	<i>Bt</i> . Varieties failure report from Andhra Pradesh
2004 - 2005	20 <i>Bt</i> . Strains released for commercial cultivation by various seed companies

## Genetics of Bt-Cotton

The bacteria *Bacillus thuringiensis* produces two types of toxins namely 1. Cry (Crystal) toxin encoded by different cry genes and 2. Kytolytic toxin. Over 50 genes have been noted to encode for cry toxin and they are sequenced for various studies. The various genes and their properties are tabulated here under.

The commercial Bt-cotton available today contain genes from the isolate *B-thuringiensis*, ssp. *Kurstaki* that produces Cry I A(a), Cry I A(b), Cry I A(c), Cry IIA.

Gene	Crystal shape	Protein size (KD)	Insect actively
Cry I A(a), A(b), A(c), B, C, D, E, F, G	Bipyramidal	130 - 138	Lepidopteran larva
Cry II (Sub group)A, B, C	Cuboidal	69 - 71	Lepidoptera, diptera
Cry III (Sub group)A, B, C	Flat irregular	73 - 74	Coleoptara
Cry IV (Sub group)A, B, C, D	Bipyramidal	73 - 134	Diptera
Cry V - IX	Various	35 - 129	Various

Following are the major advantages of *Bt* crops:

- It helps in improving the crop yield, thereby, raising the farmer's income. This results in increased farm production.
- They help in controlling soil pollution as the use of synthetic pesticides is reduced.
- *Bt* crops help in protecting beneficial insects.
- It can easily feed an increasing population due to increased yields in a short time.
- It leads to the production of disease-free crops owing to the reduction of pesticides.
- It leads to more productivity in a small area of land.

*Bt* crops have a few disadvantages as well:

- *Bt* crops are costlier than naturally grown crops.
- It can disrupt the natural process of gene flow.
- The pests might become resistant to the toxins produced by these crops and the crop production might decline.

Other draw back for developing countries from *Bt*-Hybrids

Seeds will be unaffordable for high-density, low-density planting (because of bushy nature of plant)and long duration, Pink ball worm damage, High fertilizer Use, Higher sucking pest infestation, Increasing Pesticide Use, Stagnant yield and Unsuitable for Rainfed conditions.

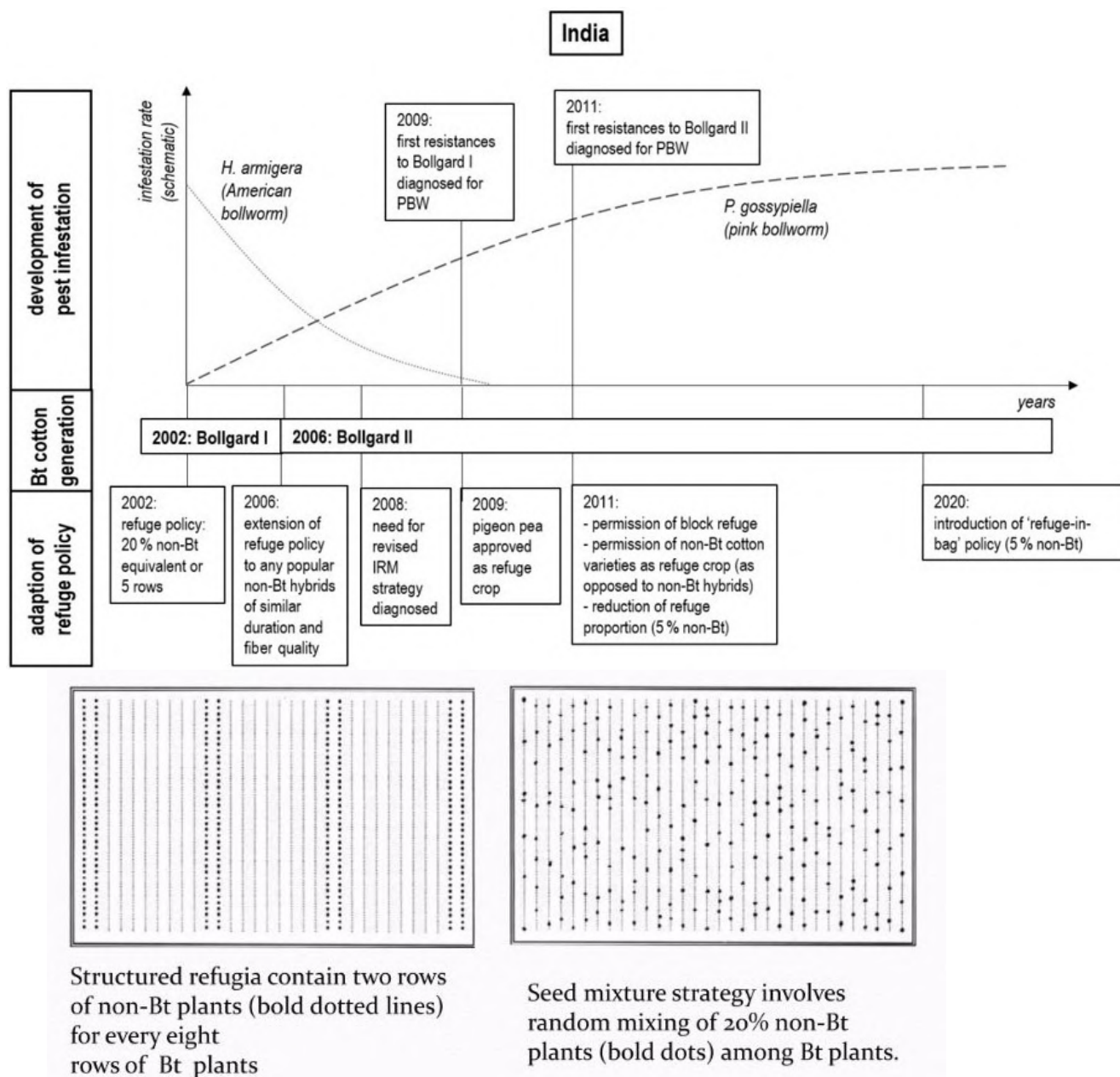
## Effects on Human and Environment:

*Bt* cotton has a history of safe use, having been in the market from long time. *Bt* is very specific; are insecticidal to the larvae of moths and butterflies, beetles, cotton bollworms, flies and not harmful to humans and other animals. It has been used in organic farming as a spray for over 50 years to control insect pests. The crop's safety evaluation done according to international scientific standards. These standards are accepted by credible bodies such as World Health Organization (WHO) and Food and Agricultural Organization (FAO). The National Bio-safety Authority (NBA), as mandated by the Bio-safety Act No.2 of 2009, having reviewed and verified the results, gave a limited approval for open field cultivation of *Bt* cotton. The *Bt* traits are also



evaluated to ensure that they do not negatively affect the ecosystem. Moreover, reduced pesticide application associated with planting *Bt* cotton is beneficial to the environment. Overall, there are no known negative impacts of *Bt* cotton on the environment relative to conventional cotton.

### Refuge strategy in *Bt* cotton



Vageeshbabu ,2011

**Figure: Methods of growing Bt and non-Bt plants for Bt resistant management.**

Technically, a 'refuge' area comprising of plants not expressing the *Bt* protein(s) is an integral part of all insect protected *Bt* crops planted to delay the evolution of resistance in insects. From a bollworm productivity standpoint, the main function of a refuge is to provide, equivalence in plant



phenotype, including matching bloom and boll-setting period to that of the *Bt* crop. These are the bedrock requirements to be fulfilled by a refuge.

### **Seed mixtures strategies:**

Seed mixture strategy involves random mixing of 20% non-*Bt* plant among *Bt* plants. Poor compliance of the Indian farmers to grow refuge crop in *Bt* cotton fields. Commercial packets of *Bt* seeds will also contain non-transgenic seeds premixed.

**RIB strategy:** In **December 2016**, the Ministry of Agriculture, Cooperation and Farmers Welfare, Government of India (GoI) in a notification endorsed the implementation of '**refuge-in-bag**' (RIB) for *Bt* cotton and specified *Bt* trait purity standards and proportion of non-*Bt* refuge seeds in the blend. A subsequent notification directed the *Bt* seed companies to implement RIB with isogenic refuge, wherever available, and implement a complete shift to **isogenic refuge** by **December 2019**.

### **Evaluation of Bt cotton**

As per powers conferred by Sections "**Regulation of Genome Engineering Technologies in India**", 8 and 25 of **Environment (Protection) Act, 1986**. These rules are essentially covering entire spectrum of activities involving GMOs.

Six Competent Authorities and their composition have been notified under these Rules that includes following:

#### **There is a 3 Tier Mechanism for Evaluation of Transgenics in India**

- RDAC: Recombinant DNA Advisory Committee. Review Development in biotech at national and international levels, recommend safety regulation for r-DNA research in India (Advisory authority)
- IBSC: Institute Bio-safety Committee (Regulating authority)  
IBSC is the nodal point of interaction within a commercial organization/applicant company involved in r-DNA research for the implementation of r-DNA guidelines. IBSC has to furnish half yearly reports on the ongoing projects in the organization to RCGM regarding the observance of the safety guidelines including accidents, risks and deviations, if any.
- RCGM: Review Committee on Genetic Manipulation (Regulating authority)  
The function of this committee is to frame the regulations for the institutions involved in r-DNA research activities.
- GEAC: Genetic Engineering Approval committee (Regulating authority)  
SBCC: State Biotech Co-ordinate committee (Monitoring function)  
DLC: District Level committee (Monitoring function)

### **Genetic Engineering Appraisal Committee (GEAC):**

Currently the top biotech regulator in India is Genetic Engineering Appraisal Committee (GEAC). The committee functions as a statutory body under the Environment Protection Act 1986 of the Ministry of Environment & Forests (MoEF). GEAC, the apex body regulates manufacturing, use, import, export and storage of hazardous micro-organisms or genetically engineered organisms and cells in the country.

GEAC is chaired by the Special Secretary/Additional Secretary of MoEF & CC and co-chaired by a representative from the Department of Biotechnology (DBT). Presently, it has 24 members and meets every month to review the applications in the areas indicated above.

### **Regulatory measures specific to transgenic seeds**

Recognizing the potential of Genetic Engineering and its relevance to India, Ministry of Science and Technology gave sufficient impetus for research and monitoring of transgenic seed development.

- The measures of transgenic regulation fall under the Environment and Protection Act, 1986 and EPA rules, 1989.
- Establishment of Department of Biotechnology in 1986 exclusively to apply biotechnological approaches in agriculture and human health. Establishment of Review Committee on Genetic Manipulation (RCGM) in 1989 for effective monitoring and evaluation which lay guide lines for assessment of GM crops.

#### **Bt detection methods:**

Central Institute for Cotton Research, Nagpur has developed diagnostic kits / *Bt* detection methods, viz: *Bt* express, *Bt* detect, *Bt* quant and *Bt*-zygosity are in common use for the detection of *Bt* toxin and these kits have been effectively deployed all over the country to verify the purity of *Bt* seed and ensure the supply of quality *Bt* hybrid seed to the farming community.

Besides, there is Seed Association of India which has been formed with a mission to promote and support the seed industry. The association assist government in formulation of seed policies, assist in harmonizing seed laws, provides strong link between Government and other members (from various public sector seed corporations and companies).

### **Seed Law Enforcement**

#### **Legal Instruments for Seeds Quality Regulation**

<b>1966</b>	Seeds Act
<b>1968</b>	Seed Rules
<b>1983</b>	Seeds (Control) Order: Licensing of seed business
<b>1988</b>	New Policy on Seed Development: Making best of the planting material available the world over to Indian farmers through public and private sectors
<b>1989</b>	Export/Import Policy: Structuring of Indian seed exports/import
<b>2004</b>	Introduction of the Seeds Bill (The Seed Bill is proposed to replace/amend the Seed Act, 1966 and Seed Rule, 1968) Special provision for registration of transgenic provided the applicant has obtained clearance from GEAC Seed Bill- 2019: The import of transgenic seeds to be done only through NBPGR after approval from GEAC as per the EPA, 1986
<b>2015</b>	Cotton Seed Price (Control) Order

#### **Need for Seed Law Enforcement**

Seed laws are designed to aid in the orderly marketing of seed. They establish regulations governing the sale of seed, thereby providing legal protection to both buyers and sellers.

No country can expect to have a well-developed, effective seed industry without seed control regulations. The responsibilities for enforcing various provisions regarding regulation of sale of seeds of notified kinds/varieties rests with the seed inspectors.

#### **Seed Law Enforcement in *Bt*. Cotton**

Seed Law Enforcement and monitoring of the *Bt*. Cotton is not satisfactory in all Cotton Growing States. The states should strictly enforce seed laws and draw the samples of *Bt*. Cotton seeds to ensure the curb of the sale of spurious *Bt*. Cotton Seeds. The infestation of White flies, Leaf Curl Virus and Pink Bollworm in *Bt*. Cotton should be monitored and controlled effectively.

However, these transgenic seeds can only be register after the applicant has obtained clearance from Environment (protection) Act, 1986.

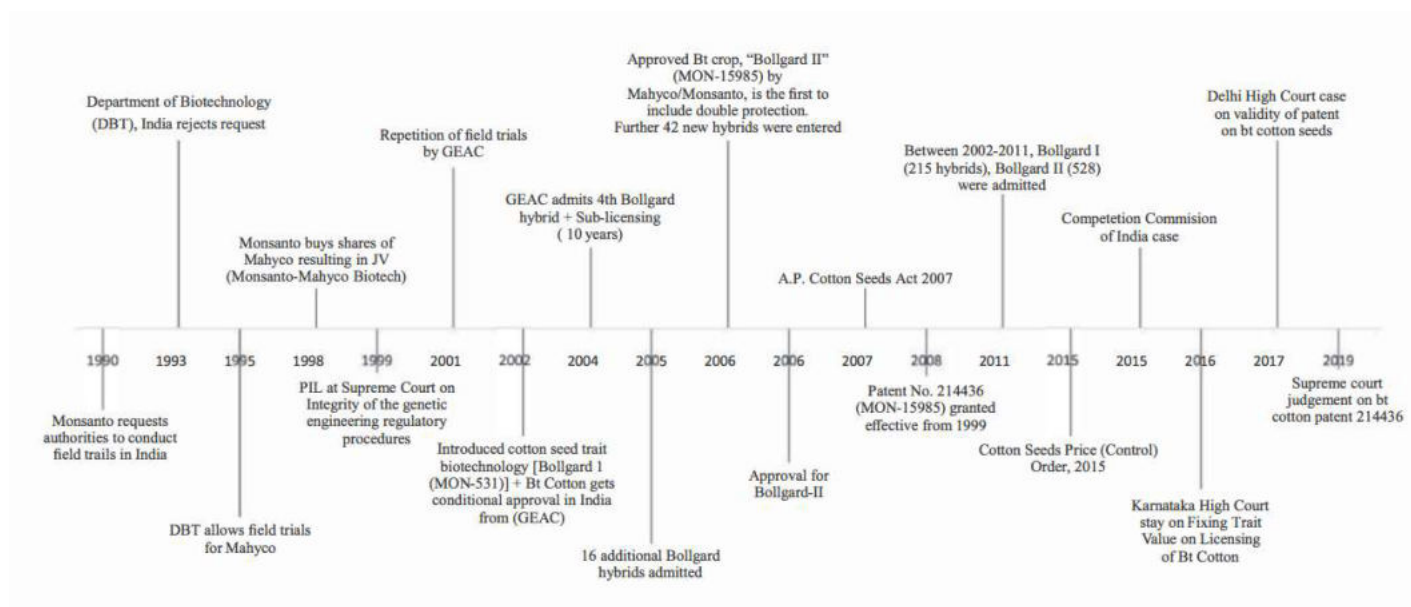
## Cotton Seed (Control) Order, 2015

An Order to provide for an effective system for fixation of sale price for cotton seeds to ensure their availability to the farmers at fair, reasonable and affordable prices; The Seeds Act, 1966 (54 of 1966) provides for regulating the quality of certain seeds for sale, and for matter connected therewith; Whereas, the Seeds (Control) Order, 1983 regulates the trading activity in seeds;

There is demand from the farmers to regulate prices of Genetically Modified Cotton Seeds such as seeds of *Bt* cotton which are found to be highly priced; certain State Governments enacted State legislations, in order to regulate the *Bt* cotton seed prices including trait value component; Fixation of sale price by multiple authorities resulted in fixation of different prices in different States and necessitated fixing of uniform prices for *Bt* cotton seeds across the country; In order to safeguard the interests of the farming community, the department issued the Cotton Seed Price (Control) Order, 2015, under section 3 of the Essential Commodities Act, 1955, to regulate *Bt* cotton seed prices. A formal notification issued in 2015, recommended that *Bt* cotton seeds packets of 450 grams would be sold at a maximum price of Rs 635 for Bollgard I version and Rs 800 for Bollgard II.

The **Trait Value** (tech fee) including taxes has been cut to **Rs 49 from Rs 183.46 per packet**. The packet of seeds was being sold at a range of prices such as Rs 1,000 in Punjab and Haryana, Rs 830 in Maharashtra and Rs 930 in Telangana. According to Agriculture Minister, the move will help farmers. "As there was no uniformity in pricing of *Bt* cotton seeds across the country, the Centre issued a Cotton Seed Price (Control) Order, 2015, **to fix a uniform price of *Bt* cotton seed across the states in the country** to be notified on or before March 31 every year for the next financial year for the benefit of farmers.

## Timeline of Events in Bt Cotton Industry (with dispute)in India



Subhas, S. P. (2021)

## Long standing dispute between Monsanto and Nuziveedu:

India: Monsanto *vs* Nuziveedu Seeds: The *Bt* Cotton Judgment (2019)

Mahyco Monsanto Biotech Pvt Ltd (India), the Indian joint venture of Monsanto has been licensing its BT products to various seed companies in India. Monsanto entered into a licensing agreement with Nuziveedu Seeds and its subsidiaries Prabhat Agri Biotech and Pravardhan Seeds on 21/2/2004.

Monsanto licensed its patent IN214436 relating to *Bt* cotton for an initial period of 10 years. A recurring trait-value compensation along with lifetime fee of Rs. 50 Lacs was charged by the Company. These patented seeds were resistant to boll-worm attacks and thus produced higher yield.

Monsanto was asked to **reduce the trait-value** fee by Indian Companies as new policies for price control were being passed by various State Governments of India. The Indian Companies stopped paying royalties when Monsanto refused to reduce the fee. Monsanto filed an application for injunction on 14/11/15 for trademark infringement and violation of registered patent in view of termination of licensing agreement and also initiated arbitration proceedings for recovery of amount of Rs. 400 Crores from the companies.

The defendants claimed for revocation of patent under **section 64 of Indian Patents Act, 1970** as it was allegedly in violation of **section 3(j)** of the said Act in respect of plants and seeds that contained DNA sequences and argued that the patent is invalid. They also contended that their rights were protected under the Protection of Plant Varieties and Farmers' Rights Act, 2001.

#### **Decision by the Single Judge:**

The Single judge decision by the Delhi High Court stated that the license was terminated by Monsanto and patent protection cannot be enforced till the suit was disposed and rejected all the claims for invalidity and rejection of patent.

Indian Companies were allowed to use the patented technology and during the pendency of the suit, the trait value compensation is to be paid by the Nuziveedu seeds as fixed by the Government Policies.

#### **Decision of Division Bench of High Court:**

Both the parties appealed before the Division bench of Delhi High Court against the decision. Monsanto challenged the single judge decision for re-instating the agreement. Nuziveedu challenged the order for the rejection of claims regarding validity of patent. Division bench of Delhi High Court considered that the subject matter was unpatentable according to section 3(j) of Patent Act, 1970.

The decision of single judge regarding payment of trait value fee was upheld and Monsanto was given a time of three months to register and seek protection of the already patented invention under **Protection of Plant Varieties and Farmers' Rights Act, 2001**.

#### **Decision by Supreme Court**

An appeal was filed in Supreme Court and the Supreme Court stated that Division bench did not confine to its adjudication by answering the question of grant of interim or permanent injunction.

The Supreme Court also stated that before a patent is revoked, Section 64 of the Patents Act and the Civil Procedure Code, 1908 require consideration of the claims in a suit and the counter claims, as well as the examination of expert witnesses and inspection of documents.

The court said that **issues raised are technical in nature** and the Division bench's decision based on mere examination of documents without any input from experts and witness was not justified. The Supreme court stated that the decision given by single judge was satisfactory and the case was remanded to the single judge for disposal.

**The arguments of Monsanto may be summarized as:**

- NAS is a microorganism hence not excluded by Section 3(j); hence patent has been validly granted;
- NAS being a microorganism, cannot be protected under the Plant Act; and
- Single plant cannot be variety, hence no protection can be claimed under the Plant Act 64.

**On the other hand, the Indian companies argued:**

- NAS being part of the seed or of the plant is excluded by Section 3 (j);
- Expression of *Bt*. genes in the seed is an essentially biological process;
- The alleged invention neither involves an inventive step nor is capable of industrial application;
- Monsanto has neither deposited biological material with IDA nor obtained approval of the National Biodiversity Authority established under the (Indian) Biological Diversity Act 2002;65
- Indian companies have neither sold the NAS in vial nor are they making it in laboratory, hence there cannot be any infringement of patent;
- The new plant variety of Monsanto can be protected under the (Indian) Plant Act.

**Conclusion/ Decision**

The decision established the *Bt* crops as important innovations that can be protected under patents and quashed all questions relating to validity of such inventions under the Patent Act.

This decision will not only reassure the companies to continue the innovation and seek protection under Patents Act, 1970 but also solve issues in Patent law related to biotechnological inventions including DNA, RNA, rDNA and research in the area.

**Conclusion**

Since patent protection is most often the core incentive for researchers in the fields of science and technology that ensures innovation and introduction of new technologies which are important for solving the domestic problems of the country and more so to compete in the age of Globalized economy; but developing countries like India need more affordable, frugal innovations and that too from the Indian research institutes and councils so that the knowledge could be distributed without barriers within India which will ultimately benefit the poor.

**Present Status**

Cotton remains the only transgenic crop that is being commercially cultivated in India. Estimates of *Bt* cotton adoption vary from state to state, but at least 80% of cotton grown in each of the nine cotton-growing states of India is *Bt* cotton. Three States, Gujarat, Maharashtra and Telangana, have deferred a proposal, approved by the Centre's Genetic Engineering Appraisal Committee (GEAC), to test a new kind of transgenic cotton seed that contains a gene, Cry2Ai, that purportedly makes cotton resistant to pink bollworm, a major pest. The conflict shows that a broad acceptance of genetically modified crops continues to be elusive.

**Gujarat, Maharashtra and Telangana rebuffed the GEAC:**

The cotton seed has been developed by the Hyderabad-based Bio-seed Research India with Cry2Ai which makes it resistant to pink bollworm. The first generations of transgenic cotton had been developed to inure cotton against a more widespread pest called the American bollworm. The Cry2Ai seed has passed preliminary, confined trials and was recommended by the GEAC to be tested in farmer's fields at Telangana, Maharashtra, Gujarat and Haryana. Agriculture being a state

### **Why Bt-cotton is facing failure only in India?**

Even though Bollgard 2, or BG-2, Monsanto's second-generation insecticidal technology for cotton, was supposed to protect crops against the pink bollworm, the pest has grown resistant to the toxins produced by this trait only in India.

The following reasons can be attributed for this:

It is often argued by scientists that *Bt*-cotton seeds are not suitable under Monsoon conditions.

Unlike other Cotton-growing countries where open-pollinated cotton varieties are grown, Indian cotton farmers only opt for hybrid varieties.

subject means that, in most cases, companies interested in testing their seeds need approvals from the States for conducting such tests. Only Haryana gave permission for these tests.

### **Conceivable changes in the offing in process of regulation of GM crops:**

The GEAC consists of a panel of plant biotechnologists and is headed by a senior official of the Environment Ministry and co-chaired by the scientist of the DBT.

To resolve the issue of States not according to approvals on testing, because of differing attitudes to GM crops, the GEAC is considering a proposal by the DBT to declare some regions across India as 'notified testing sites'. There are 42 such proposed sites and, if it goes through, companies and institutions wanting to conduct trials of GM crops at these locations won't need the permission of States for trials.

### **Has Indian farmer benefitted at all ?**

Opinions are divided on this. Definitely big farmers and corporate sector have benefited from the introduction of *Bt*-cotton. But it is the middle and small farmers who have suffered a lot with *Bt*-cotton.

According to Rajya Sabha 301<sup>st</sup> committee report, the use of insecticides increased steeply both in value and quantity. Farmers were forced to pay almost triple the price of regular seeds for *Bt* cotton seeds, increasing indebtedness and reliance on high yield. This increase in indebtedness led to an increase in farmer suicides, in light of failure of crop yield.

(Source: <https://www.thehindu.com/sci-tech/agriculture/explained-what-is-the-status-of-transgenic-crops-in-india/article66968448.ece>)

### **WAY FORWARD WITH...**

The important thing for India is to keep incentivizing the development of such technologies and to use them properly.

Strong patent protection is a crucial part of this process. Without doubt *Bt*-cotton in India provided a lot of impetus to the Indian textile sector thus creating a lot of employment around, but the gains made were short term in nature, manifested in the recent upheaval in our agriculture sector. Now, it's time to move over to a better and equitable upgrade to *Bt*-cotton and perhaps resort back to indigenously grown cotton which would create equity for farmers and sustainability to environment.

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# Seed Legislation System in India

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## Introduction

Seed is the fundamental and important input for a successful agriculture production. Agricultural sector is very much dependent on the timely availability and quality of seeds for a fruitful harvest. Quality seed alone is estimated to contribute 15-20% to total crop production. In India, agriculture is the main occupation, and thus provide rich opportunities for the seed market. India is one of the largest potential seed market in the world. According to a report, the Indian seeds market reached a value of US\$ 3.6 Billion in 2017, exhibiting a CAGR of around 17% during 2010-2017, which is further expected to grow at a CAGR of 14.3% during 2018-2023, reaching a value of more than US\$ 8 Billion by 2023. The Indian seed industry is the fifth largest seed market in the world, accounting for 4.4% of global seed market after the U.S. (27%), China (20%), France (8%) and Brazil (6%). In terms of global trade, India is almost self-sufficient in flower, fruits and vegetables and field crops seeds. Thus, it is essential to increase the production and distribution of quality seeds. Seed quality gets more significance in view of emerging biotic and abiotic stresses, issues related to quality and phytosanitary measures, competition in domestic/international markets and emerging food needs.

It is important to maintain its purity and quality through various stages of seed production i.e. Breeder, foundation, registered and certified seed. Measures of seed legislation with respect to quantity and quality were initiated in the country by establishment of NSC (1963) under Ministry of Agriculture (seed sector was majorly under public sector). Government of India had framed and brought out different legislations to protect the quality of seeds and planting materials - Seeds Act (1966), Seed Rules (1968), Seed (Control) Order (1983), New Policy on Seed Development (1988), Plants, Fruits & Seeds (Regulation of import into India), 1989, The PPV & FR Act (2001), Essential Commodities Act including Seeds (1955), National Seed Policy (2002) and Seed Bill (2004) to take care of seeds right from the production to marking, labeling and marketing levels to maintain the quality standards as prescribed. These laws are framed in order to make available quality seeds to a common farmer and train them to approach authority for justice.

## Seed Legislations by Government of India

### Seeds Act (1966)

**The Seeds Act (1966) has a total of 25 Sections, mentioned as under:**

1. Enacted by Parliament for the whole of India to regulate seeds.
2. Definitions and seeds of food crops, oil crops, cotton seeds, seeds of cattle fodder and all types of vegetative propagating material are included (16 Clauses).

Clause 11 says - "seed" means any of the following classes of seeds used for sowing or planting-

- (i) seeds of food crops including edible oil seeds and seeds of fruits and vegetables;

(ii) cotton seeds;

(iii) seeds of cattle fodder;

and includes seedlings, and tubers, bulbs, rhizomes, roots, cuttings, all types of grafts and their vegetatively propagated material, of food crops or cattle fodder.

### **Amendment of Section 2 of 1966**

#### **The Seeds (Amendment) ACT, 1972 [9th September, 1972]**

In section 2 of the Seeds Act, 1966, in clause (11), after sub-clause (iii), the following sub-clause shall be inserted, namely:- (iv) jute seeds.

3. Constitution of a **Central Seed Committee** to advise the Central and State Governments on matters arising out of the administration of this act and carry out other functions assigned to it by the Act.

There are 7 clauses in this section –

#### **Clause 2: The Committee shall consist of the following members, namely:-**

- i. A Chairman to be nominated by the Central Government;
- ii. 8 persons to be nominated by the Central Government to represent such interests that Government thinks fit, of whom not less than two persons shall be representatives of growers of seed;
- iii. One person to be nominated by the Government of each of the States.
- iv. Other clauses deals with the formation of sub-committees, their tenure, making bye-laws for fixing the quorum and regulating its own procedure, etc.
- v. Establishing a Central Seed Laboratory as well as State Seed Laboratory to carry out seed analysis of notified variety. [2 clauses - State Govt. may establish or declare State Seed Lab.].
  3. Empowerment of the Central Seed Committee to notify any variety found suitable as per the Act after notification in the Official Gazette for different states or different areas.
  4. Empowerment of the committee to fix the minimum limits of germination and purity of seed for a variety to be notified as well as for marking or labeling a seed lot to be sold commercially.
  5. Regulation of sale of seeds of notified varieties by compulsory labeling, revealing the true identity of the variety, germination as well as purity.
  6. Constituting a certification agency for undertaking the process of certification. The State Government or the Central Government in consultation with the State Government may establish a certification agency for the State to carry out the functions entrusted to the certification agency by or under this Act.

#### **The Seeds (Amendment) ACT, 1972 [9th September, 1972]**

#### **Insertion of new sections 8A to 8E**

After section 8 of the principal Act, the following sections shall be inserted, namely:

#### The Central Seed Certification Board

**8A.(1)** The Central Government shall establish a Central Seed Certification Board (hereinafter referred as Board) to advise the Central Government and the State Governments on all



matters relating to certification and to co-ordinate the functioning of the agencies established under section 8.

8A. (2) The Board shall consist of the following members, namely:-

- (i) A Chairman, to be nominated by the Central Government;
- (ii) Four members, to be nominated by the GoI from the persons employed by the State Governments as Directors of Agriculture;
- (iii) Three members, to be nominated by the GoI from the persons employed by the AUs as Directors of Research;
- (iv) 13 persons, to be nominated by the GoI to represent such interests as that Government thinks fit, of whom not less than 4 persons shall be representatives of seed producers or tradesmen.

8A. (3) A member of the Board shall, (unless his seat becomes vacant either by resignation or otherwise,) be entitled to hold office for two years from the date of his nomination:

Provided that a person nominated under clause (ii) or clause (iii) of sub-section (2) shall hold office only for so long as he holds the appointment by virtue of which his nomination was made.

### **Other Committees**

8B. The Board may appoint as many Committees as it deems fit consisting wholly of the members of the Board or wholly of other persons or partly of members of the Board and partly of other persons as it thinks fit to exercise such powers and perform such duties as may be delegated to them, subject to such conditions as it may think fit, by the Board.

8C. No proceeding of the Board or any Committee thereof shall become invalid merely by reason of the existence of any vacancy therein or any defect in the constitution thereof.

### **Procedure for Board**

8D. The Board may, (subject to the previous approval of the Central Government), make bye-laws for the purpose of regulating its own procedure and the procedure of any Committee thereof and the conduct of all business to be transacted by it or such Committee.

### **Secretary and other officers**

8E. The Central Government shall-

- (i) appoint a person to be the Secretary of the Board, and
- (ii) provide the Board with such technical and other staff as the Central Govt. considers necessary."

- 9. Power of certification agency to recommend notification of suitable variety and grant of notification certificate provided the seed meets minimum limits of germination and purity.

Section 9 has 3 sub-sections:

### **The Seeds (Amendment) ACT, 1972 [9th September, 1972]**

#### **Amendment of section 9**

In section 9 of the principal Act,-

- (i) in sub-section (3), for the words, brackets, letter and figure "minimum limits of germination and purity specified for that seed under clause (a) of section 6", the words "prescribed standards" shall be substituted;
- (ii) to sub-section (3), the following proviso shall be added, namely:-

"Provided that such standards shall not be lower than the minimum limits of germination and purity specified for that seed under clause (a) of section 6."

10. Empowerment to the Certification agency for **revocation of certificate** if the agency is convinced that holder has obtained certificate (under Sec. 9) by misrepresentation or not complied with the conditions.

**Opportunity of show cause is given.**

11. Provision for an appeal by the holder on payment basis to express before an appellate authority. (Sec 11 has 3 sub-sections).

Any person aggrieved by a decision of a certification agency under Sec 9 or Sec 10, may appeal to authority specified by the State Govt. within thirty days from the date on which the decision is communicated to him and on payment of such fees as may be prescribed:

On receipt of an appeal under sub-section (1), the appellate authority shall, after giving the appellant an opportunity of being heard, dispose of the appeal as expeditiously as possible.

Every order of the appellate authority under this section shall be final.

12. Appointment of a seed analyst to undertake seed testing.
13. Appointment of seed inspector who is deemed to be a public servant within the meaning of section 21 of the Indian Penal Code (45 of 1860).
14. Empowerment of seed inspector to draw samples from any seller or a purchaser and verify the quality by sending samples to a seed analyst in the seed testing laboratory. (5 sub-sections & 5 Clauses). Examine records, registers, docs... seize.

Where the Seed Inspector takes any action under clause (a) of sub-section (1), he shall call at least two persons to be present at the time when such action is taken and take their signatures on a memorandum to be prepared in the prescribed form and manner.

The provisions of the Code of Criminal Procedure, 1898 (5 of 1898), shall, apply to any search or seizure under this section as they apply to any search or seizure made under the authority of a warrant issued under section 98 of the said Code.

15. Laying-out of procedure for seed sample collection and other rules. The section also entrust inspector with the power to break open any seed container or door of any premises where such seed may be kept for sale, under those circumstances when owner refuses to cooperate. The whole operation has to be done in presence of two witnesses with their signatures on a memorandum. (5 sub-sections).
16. Responsibility of Seed analyst to report the results in a specified format after analysis of the seed samples to Seed Inspector as well as the seller/ purchaser. Complainant if dissatisfied

with the result can apply to the court for sending samples to Central Seed Testing Laboratory. Central seed laboratory shall thereupon send its report to the court in the prescribed format within one month from the date of receipt of the sample.

The report sent by the Central Seed Laboratory shall supersede the report given by the Seed Analyst.

17. Restriction on import and export of seeds of notified varieties. Any variety imported or exported should meet the minimum limits of seed germination and purity marked or labeled on the container.
18. The Central Govt., on recommendation of the Committee, Recognize seed certification agencies of foreign countries for the purpose of this act.
19. Penalty or punishment or both for those who do not comply with the provisions of the act and also prevent seed inspectors from executing his power.  
First offence with fine which may extend to **five hundred rupees**, and if previously convicted, imprisonment up to 6 months, or fine of Rs.1000/- or both.
17. Forfeiture of property (seeds) belonging to any person convicted under this act, due to contravention (breach) of the procedures under this act.
18. Punishment for offences committed by companies or any corporate. All who was in-charge of, when the time the offence was committed and was responsible to the company shall be deemed to be guilty of the offence and punished accordingly.
19. Protection of Government action taken in good faith, i.e. no prosecution or legal proceeding will lie against Government or any Government Officer for anything that is done in good faith.
20. Power for Central Govt. to give directions to any state govt. for smooth conduct of the act.
21. **Exemption** - Non-application of the act to the seed exchange by the farmers without any brand name.
22. Power of Government to make rules to carry out various functions of Central Seed Committee, Central Seed Laboratory, Certification Agency and Seed Inspectors.

### **The Seeds (Amendment) ACT, 1972 [9th September, 1972]**

#### **Amendment of section 25**

In section 25 of the principal Act,-

(a) in sub-section (2), after clause (f), the following clause shall be inserted, namely:-

“(ff) the standards to which seeds should conform,”;

(f) the form of application for the grant of a certificate under section 9, the particulars it may contain, the fees which should accompany it, the form of the certificate and the conditions subject to which the certificate may be granted;

(b) in sub-section (3), for the words “in two successive sessions, and if, before the expiry of the session in which it is so laid or the session immediately following”, the words “in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid” shall be substituted.

## **Seed Rules, 1968**

The rules were framed to implement various legislations given under Seeds Act, 1966. It contain **11 sections (39 rules)**.

### **I. Preliminary (Rules 1 to 2: Short titles & Definitions)**

This section provides short title, definitions of various terminology used under the seed rule.

### **II. Central Seed committee (Rules 3 to 4: Functions of the Central Seed Committee & Travelling and Daily Allowances Payable to Members of the Committee and its sub-Committees)**

This section describes the specific functions entrusted to the committee by the act such as recommendation for Seed Testing fee, advice on the suitability of seed testing laboratory, recommendation for the procedure and standards for seed certification and testing. Also the rules provide details of traveling and daily allowances payable to the members of the committee.

### **III. Central Seed Laboratory (Rule 5 – Functions)**

This section describes the specific functions entrusted to the Central Seed Laboratory such as coordinating with State Seed Laboratories for uniformity in test results, collecting data on quality of seeds available in the market and any other function assigned to it by the Central Government.

### **IV. Seed Certification Agency (Rule 6. Functions of the Certification Agency)**

This section deals with the specific functions entrusted to the Certification Agency such as outlining the procedure for submission of applications, growing, harvesting and processing and storage of seeds indented for certification, maintaining a list of recognized nucleus seed breeders, inspections of seed production fields, seed processing plant and seed stores, grant of certificates.

### **V. Marking or Labeling (Rules 7 to 12: Responsibility for Marking or Labeling, Contents of the mark or label, Manner of marking or labelling the container under clause (C) of section 7 and clause (B) of section 17, Mark or Label not to contain false or misleading statement, Mark or label not to contain reference to the Act or Rules contradictory to required Particulars, and Denial of Responsibility for mark or label content prohibited)**

Rules for marking or labeling of seed lots indented for certification have been provided in this section. The label should contain name of the person or agency that produced the seed and shall be responsible for the accuracy of information given in the unopened original container. The label should contain the name, the address of the person offering the sale of the seed, name of the variety, germination and purity level of the seed, net weight of the seed, date of seed testing and a statement if the seed is treated. Any transparent cover used solely for the purpose of packing during transport or delivery need not be marked or labeled.

### **VI. Requirements for Certification (Rule 13 to 14: Requirements to be complied with by a person carrying on the Business referred to in Section 7 and Classes and sources of certified seed)**

Three classes of certified seed have been specified in this section, viz. Foundation (progeny of breeder seed), Registered (progeny of foundation seed) and Certified (progeny of registered / foundation seed) and each class shall meet the specific standards. Certification agency has the discretion of producing certified seed from certified seed provided that it does not exceed three generation and the genetic purity is not significantly altered.

## **VII. Certification of seeds (Rules 15 to 17: Application for the Grant of a Certificate, Fees and Certificate)**

The detailed procedure of seed certification starting from applying for certification till the grant of certificate has been provided in this section. Application has been outlined by the certification agency containing the name and details of the applicant, the name of the seed to be certified, class and source of the seed, germination and purity and mark or label. A fee of Rs. 25 is levied for certification.

Once certified, the certification tag containing information such as name and address of the certification agency, name of variety, lot number, name and address of the producer, date of issue of its certificate and its validity, an appropriate sign, to designate certified seed. The color of the tag shall be white for foundation, purple for registered and blue for certified seed. The holder of certificate shall allow any seed inspector to enter and inspect the seeds kept for sale, registers or other documents.

### **The Seeds (Amendment) Rules, 1981 [10<sup>th</sup> June, 1981]**

After rule 17 of the Seeds Rules, 1968, the following rule shall be inserted, namely:-

**17-A.** The Certification agency shall, before granting the certificate, ensure that the seed conforms to the standards laid down in the Manual known as "Indian Minimum Seed Certification Standards" published by the Central Seed Committee, as amended from time to time.

The amendment says certification agency shall ensure that the seed standards confirm to the minimum seed certification standards laid down in the manual known as Indian Minimum Seed Certification Standards published by the Central Seed Committee which is commonly called as Blue Book.

## **VIII. Appeal (Rule 18 to 19): The form and manner in which and the fee on payment of which the appeal may be referred and Procedure to be followed by the Appellate Authority)**

Provision for appeal has been provided by submitting a memorandum accompanied by a treasury receipt for Rs. 100. The appellate authority shall exercise all the powers which a court has, while deciding appeal under the code of civil procedure, 1908.

- **Rule 19: Procedure to be followed by the Appellate Authority.** – In deciding appeals under the Act the appellate authority shall exercise all the powers which a Court has and shall follow the same procedure which a Court follows in deciding appeals from the decree or order of an original Court under the Code of Civil Procedure, 1908 (5 of 1908).

### **The Seeds (Amendment) Rules, 1973 (30<sup>th</sup> June 1973)**

- ✓ In rule 19 of the Seeds Rule, 1968 the words, 'shall exercise all the powers which a Court has and' shall be omitted.
- ✓ **IX. Seed Analyst and Seed Inspectors (Rule 20 – 23: Qualifications of Seed Analyst, Duties of a Seed Analyst, Qualifications of Seed Inspectors and Duties of a Seed Inspector)**
- ✓ The specific qualifications and duties of seed analyst and seed inspectors have been provided in this section. Seed analyst should possess a Master Degree in Agriculture/ Agronomy/ Botany/ Horticulture from a recognized University with at least one year experience in Seed Technology or possess a Bachelors degree in Agriculture/Botany from a recognized university with a minimum of three years experience in Seed Technology for this purpose. Seed analyst shall analyze the seed samples according to the provisions of the Act. Seed Inspector shall be a graduate in agriculture with at least one year experience in Seed Technology.

**Rule 21: Duties of a Seed Analyst.** – On receipt of a sample for analysis the Seed Analyst shall first ascertain that the mark and the seal or fastening as provided in clause (b) of sub-section (1) of section 15 are intact and shall note the condition of the seals thereon.

(2) The Seed Analyst shall analyze the samples according to the provisions of the Act and these rules.

(3) The Seed Analyst shall deliver the copy of the report of the result of the analysis to the persons specified in sub-section (1) of section 16.

(4) The Seed Analyst shall from time to time forward to the State Government the reports giving the result of analytical work done by him.

### **The Seeds (Amendment) Rules, 1973 (30<sup>th</sup> June 1973)**

- In rule 21 of the said rules for sub-rules (2) and (3) the following sub-rules shall be substituted, namely:
- "(2) The Seed Analyst shall analyze the samples in accordance with the procedures laid down in the Seed Testing Manual published by the Indian Council of Agricultural Research as amended from time to time."
- "(3) The Seed Analyst shall deliver in Form VII, a copy of the report of the result of analysis to the persons specified in sub-section (1) of Section 16, as soon as may be but not later than 30 days from the date of receipt of samples sent by the Seed Inspector under sub-section (2) of the Section 15".
- **Rule 23; clause h (Duties of a Seed Inspector) -**
- (h) perform such other duties as may be entrusted to him by the competent authority.
- **The Seeds (Amendment) Rules, 1973 (30<sup>th</sup> June 1973)**
- In rule 23 of the said rules, in clause (h) for the words competent authority "the words" State Government shall be substituted.

### **The Seeds (Amendment) Rules, 1974 (29<sup>th</sup> April 1975)**

**After rule 23 of the said rules, the following rule shall be inserted namely:-**

**"23-A. Action to be taken by the Seed Inspector if a complaint is lodged with him:-**

(1) If farmer has lodged a complaint in writing that the failure of the crop is due to the defective quality of seeds of any notified kind or variety supplied to him, the Seed Inspector shall take in his possession the marks or labels, the seed containers and a sample of unused seeds to the extent possible from the complaint for establishing the source of supply of seeds and shall investigate the causes of the failure of his crop by sending samples of the lot to the Seed Analyst for detailed analysis at the State Seed Testing Laboratory. He shall thereupon submit the report of his findings as soon as possible to the competent authority.

(2) In case, the Seed Inspector comes to the conclusion that the failure of the crop is due to the quality of seeds supplied to the farmer being less than the minimum standards notified by the Central Government, launch proceedings against the supplier for contravention of the provisions of the Act or these Rules."

## **Part X. Sealing, Fastening, Dispatch and Analysis of Samples**

**(Rules 24 to 37:** Manner of taking Samples, Containers to be labeled and addressed, Manner of Packing Fastening and Sealing the Samples, Form of Order, Form of Receipt for Records, how to be sent samples to the Seed Analyst, Memorandum and Impression of seal to be sent separately, Addition of Preservatives to Samples, Nature and Quantity of the Preservative to be noted on the Label, Analysis of the Sample, Form of Notice, Form of Report, Fees and Retaining of the Sample)

The details of sampling, labeling, manner of packing and sealing the samples as well as its dispatch to the seed analyst has been provided.

- Samples of any seed shall be taken in a clean dry, moisture and leakage proof container and shall be carefully sealed.
- The label on any sample of seed sent for analysis shall bear:
  - a. serial number;
  - b. name of the sender with official designation, if any;
  - c. name of the person from whom the sample has been taken.
  - d. Date and place of taking the sample;
  - e. Kind or variety of the seed for analysis;
  - f. Nature and quantity of preservative, if any, added to the sample.
- The container of sample for analysis shall be sent to the Seed Analyst by registered post or by hand in a sealed packet enclosed together with a memorandum in Form V in an outer cover addressed to the Seed Analyst.  
**It should be ensured that the sample reach the destination without any kind of damage/alterations/leakage.**
- Whenever any **preservative** is added to a sample, the nature and quantity of the preservative added shall be clearly noted on the label to be affixed to the container.
- **Analysis of the sample** - On receipt of the packet, it shall be opened either by the Seed Analyst or by an officer authorized in writing in that behalf by the Seed Analyst, who shall record the condition of the seal on the packet. Analysis of the sample shall be carried out at the State Seed Laboratory in accordance with the procedure laid down by the Central Government.

- **Form of notice:** In Form VI, the notice be given under clause (a) of sub section (1) of section 15 to the person from whom the Seed Inspector intends to take sample.
- **Form of report :** In Form VII, the result of the analysis be delivered.
- **Fees:** Rs. 10/- per sample of the seed analyzed.
- **Retaining of the sample:** The sample of any seed shall, under clause (c) of Sub-section (2) of section 15, be retained under a cool, dry environment to eliminate the loss of viability and in insect proof or rat proof containers (good quality of uniform shape & size). The containers shall be dusted with suitable insecticides and the storage room fumigated to avoid infestation of samples by insects.
- **Part XI. Miscellaneous (Rules 38 to 39: Records and Form of Memorandum)**
- The need to maintain stock record of seeds and record of the sale of seed have been provided in this section.
- **Records:** A person carrying on the business referred to in section 7 shall maintain the following records, namely:
  - a. stock record of seed;
  - b. record of the sale of seeds;
- **Form of Memorandum:** - The memorandum to be prepared under sub-section (4) of section 14 shall be in Form VIII.

#### **Seeds (Control) Order, 1983 [30th December, 1983]**

In exercise of the powers conferred by section 3 of the Essential Commodities Act, 1955, the Central Government hereby makes the **Seeds (Control) Order**.

**Dealer to obtain license:-** No person shall carry on the business of selling, exporting or importing seeds at any place except under and in accordance with the terms and conditions of license granted to him under this order.

**Application for license:-** Every person desiring to obtain a license for selling, exporting or importing seeds shall make an application in duplicate in Form 'A' together with a fee of rupees fifty for license to licensing authority.

#### **Grant and refusal of license:-**

**(1)** The licensing authority may, after making such enquiry as it thinks fit, grant a license in Form 'B' to any person who applies for it under clause 4:

A license shall not be issued to a person-

- (a) whose earlier license granted under this Order is under suspension, during the period of such suspension;
- (b) whose earlier license granted under this Order has been cancelled, within a period of one year from the date of such cancellation.
- (c) who has been convicted under the Essential Commodities Act, 1955 or any order issued thereunder within three years preceding the date of application.

**(2)** When the licensing authority refuses to grant license to a person who applies for it under clause 4, he shall record his reasons for doing so.

**Period of validity of license:-** Valid for three years from the date of its issue.



**Renewal of license:-** An application for renewal in duplicate, in Form C is made before the expiry of the license along with a fee of Rs.20/-

If any application for renewal is not made before the expiry of the license, but is made within one month from the date of expiry of the license, the license may be renewed on payment of additional fee of rupees twenty five, in addition to the fee for renewal of license.

- ✓ The seed dealer has to essentially display the stock position (opening and closing) on daily basis along with a list indicating prices or rates of different seeds.
- ✓ A cash or credit memorandum has to be given by the dealer to purchaser of seeds, compulsorily.

**Appointment of licensing authority -** The State Government is empowered with appointing a licensing authority, inspectors and mode of action for supply regulation.

**Appointment of Inspectors -** The State Government may appoint inspectors and define the area within which each such Inspector shall exercise his jurisdiction.

### **Inspection and punishment**

- An Inspector may ask any dealer to give any information with respect to purchase, storage and sale of seeds; enter upon and search any premises where any seed is stored; draw samples of seeds meant for sale, export and seeds imported for confirmation of Quality Standards, seize or detain any seed in respect of which he has reason to believe that a contravention of this Order has been committed or is being committed and seize any books of accounts or document relating to any seed.
- The Inspector shall give a receipt, in respect of books of accounts or documents seized and return the seized books of accounts or documents after the purpose is solved.
- The provision of section 100 of the Code of Criminal Procedure, 1973 relating to search and seizure shall apply to searches and seizures.
- The Inspector shall report the fact of seizure to a Magistrate where-upon the provisions of sections 457 and 458 of the Code of Criminal Procedure, 1973 shall apply.
- Every person, if so required by an Inspector, shall be bound to offer all necessary facilities to him for the purpose of enabling him to exercise his power under this clause.

**Time limit for analysis -** Under this order the time period for completion of seed analysis in case of any doubt about quality is 60 days compared to 30 days under Seed Rules.

**Suspension/Cancellation of license:-** The licensing authority may, after giving the holder of the license an opportunity of being heard, suspend or cancel the license on the following grounds, namely:-

- (a) that the license had been obtained by misrepresentation as to a material, or
- (b) that any of the provisions of this Order or any condition of license has been contravened.

**Appeal -** Any person aggrieved by an order, may within sixty days (along with Rs. 20/-), appeal to authority as the State Government may specify, and the decision of such authority shall be final.

**Amendment of license -** Upon a written request along with Rs. 10/-, the licensing authority may amend the license of the dealer.

**Maintenance of records and submission of returns, etc** - Every dealer shall maintain books, accounts and records and submit monthly return (by 5<sup>th</sup> of every month) relating to his business as may be directed by the State Government.

### **New Policy on Seed Development, 1988**

The policy was formulated to provide Indian farmers with access to the best available seeds and planting materials of domestic as well as imported.

- ❖ The policy permits the import of selected seeds under Open General License (OGL), to make available high quality seeds to farmers to maximize yield, increase productivity thereby farm income.
  - The policy allows import under OGL of items such as seeds of oilseed crops, pulses, coarse grains, vegetables, flowers, ornamental plants, tubers, bulbs, cuttings and saplings of flowers.
- ❖ While the import of horticultural crops including flowers need recommendation from Directors of Horticulture, import of crop seeds require permission from ICAR.
  - ICAR will direct MLT in various agro-climatic conditions at least for one season.
- ❖ Evaluation of important traits such as yield, pest resistance etc. needs to be done within 3 months of harvest after which importer shall apply to the DAC for permit.
  - Within a month, DAC will process it and thereafter controller of Imports and Exports will issue a license.

The policy was immediately followed by an order by Government of India (Plants, Fruits and Seeds Order) for the purpose to regulate the import of agricultural items into India.

### **Plants, Fruits and Seeds Order**

#### **(Regulation of Import into India order) 1989**

- ❑ Post entry quarantine facilities shall be established which shall be permitted to be released by Designated Inspection Authority.
- ❑ Import of any form of seed for consumption or sowing should carry a permit issued by the competent authority, and the import should be only through specified customs stations.
- ❑ The consignment shall be inspected by the Plant Protection Advisor.
- Amendments have been made for the above order during 1998, 2000 and 2001.
- With the liberalized trade in agriculture, as consequence to WTO agreements, Government thought of providing new legislative provisions under the new order.

#### **Plant Quarantine (Regulation of import into India) Order, 2003**

- The Order has now replaced the Plants, Fruits and Seeds order, 1989.
- The order has widened the scope of plant quarantine activities and has made pest risk analysis compulsory for imports
- The order includes provision for regulating the import of soil, moss, germplasm and GMO's for research, insects, microbial cultures and bio-control agents, timber and wooden logs
- The order prohibits import of commodities contaminated with weeds, alien species, and packaging material of plant origin unless the material has been treated.

- Agricultural imports are thus classified as: prohibited plant species, restricted species where import permitted only by authorized institutions and declarations and plant material imported for consumption or industrial processing permitted with phytosanitary certificate (to prevent spread of noxious pests).
- Pest risk analysis during post entry quarantine is compulsory.
- Import of germplasm has to be permitted by NBPGR and any other biological materials such as soil, microbes, moss etc. has to be permitted by Plant Protection Advisor.
- Notified entry points for import have been increased compared to PFS Order, 1989 (26 quarantine and fumigation stations located at 10 airports, 9 seaports and 7 land frontiers)
- Strengthening Plant Quarantine facilities, opening new quarantine stations, establishing advanced molecular diagnostic facilities for rapid pathogen detection, setting up of National Pest Risk Analysis unit are other important features of the Order.

### **Protection of Plant Varieties and Farmers' Rights Act, 2001**

- Global realization on the role of plant genetic resources in development of superior crop varieties and use of many traditionally grown plants in development of medicines and various industrial applications raised concerns for Conservation of Biological Diversity (CBD) which came into force in the year 1993.
- Government of India felt the need to provide protection to plant varieties which have tremendous commercial value after India became signatory to the Trade Related Aspects of Intellectual Property Rights Agreement (TRIPS) in the year 1994.
- The TRIPS agreement required the member countries to provide for protection of plant varieties either by a patent or by an effective *sui generis system or by any combination thereof*. The *sui generis* system for protection of plant varieties was developed by India integrating the rights of breeders, farmers, and village communities. **The Protection of Plant Varieties and Farmers Right Act was thus formulated in the year 2001.**
- The PPV&FR Act covers all categories of plants except microorganisms.
- Crops important for India in the world trade, species of Indian origin, crops where India could benefit from introduction of new germplasm are the priorities.
- The act is unique in the world with inclusion of rights of farmers, breeders, and researchers.
- A variety can be registered for protection if it satisfies the criteria of Novelty, Distinctness, Uniformity and Stability (NDUS).
- Farmers can save, re-sow, exchange, share and sell farm produce of any protected variety except its commercial marketing with brand name.

### **National Seed Policy, 2002**

National Seed Policy was formulated in 2002 to raise India's share in the global seed trade by facilitating advanced scientific aspects such as biotechnology to farmers and in March 2002, first transgenic Bt cotton was approved for commercial cultivation in India.

- The policy encourages private sector participation in research and development of new plant varieties.

- The rights empowered to various bodies for regulating the quality of seeds produced, distributed and for providing variety protection as per the Seeds Act, 1966 and PPV & FR Act, 2001 have been retained in the policy.
- Promotion of seed village scheme to increase the production and make available the seeds in time as well as upgrading the quality of farmers' saved seeds.
- Establishment of a National Seed Board in place of Central Seed Committee and Central Seed Certification Board to undertake seed certification and advising Government on all matters related to seed planning and development. NSB will serve as the apex body in the seed sector.
- Setting up of National Seed Research and Training Centre (NSRTC, 2005) to impart training in seed technology.
- The Central Seed Testing Laboratory will be established at the National Seed Research and Training Center to perform referral and other functions as required under the Seeds Act.
- Development of a National Seed Grid to provide information on availability of different varieties of seeds with production details. Both public and private sector will be encouraged to join the grid for a clear assessment of demand and supply of seeds.
- All genetically engineered crops/varieties will be tested for environment and bio-safety before their commercial release, as per the regulations and guidelines of the Environment Protection Act (EPA), 1986.
- All seeds imported into the country will be required to be accompanied by a certificate from the Competent Authority of the exporting country regarding their transgenic character or otherwise.
- All importers will make available a small sample of the imported seed to the Gene Bank maintained by NBPGR.
- Incentives will be provided to the domestic seed industry to enable it to produce seeds of high yielding varieties and hybrid seeds at a faster pace to meet the challenges of domestic requirements.
- The Department of Agriculture & Cooperation (DAC) will supervise the overall implementation and monitoring of the National Seeds Policy.

Few of Policy's other recommendations have been addressed in PPV &FR, Act, 2001 also. Major ones are maintenance of a National Register on seeds of varieties, establishing a national gene fund, disclosure of the variety's expected performance and provision for farmer to claim compensation in case of crop failure.

Further, aims of National Seed Policy such as development of infrastructure, ensuring supply of good quality seeds and facilitating the International seed trade are sought to be addressed through the proposed Seeds Bill, 2004.

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## Duties and Responsibilities of Seed Inspectors

Dr. Rajesh Kumar

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### Introduction

Quality seed is the backbone to all the success in agriculture. Best technology reaches farmers through quality seeds. Seed quality includes germination, vigour, genetic purity, physical purity, optimum moisture content and free from pest and diseases. Seed Act 1966, Seed Rules 1968, and Seed Control Order 1983 etc., by Indian Government are ensuring the availability of quality seeds in Indian market. When the seed is in market, the quality of the seed is being monitored and controlled by seed inspectors. Under the provision given in Section 13 of Seed Act 1966 or Clause 12 of Seed Control Order 1983, the State Government may by notification in the Official Gazette appoint Seed Inspectors and may in such notification define the local area within which each such Inspector shall exercise his jurisdiction.

### Qualifications of Inspector

1. Seed Inspector must have a huge level of integrity, initiative and above all pleasing manners. He should be tactful, discrete, fair, friendly and firm when firmness is needed in dealing with people. He must have no financial interest in the seed industry. He must be totally dedicated to the seed quality control in seed market and healthy growth and development of the industry.
2. The Inspector must act an educator and disseminate information and cause seeds men to recognize the benefits of complying with the Act. He should have right attitude towards his work and the manner in which he carries out his duties for successful enforcement of the Act. The seed industry cannot carry out the provisions of the Act unless they know what is expected of them.
3. The Inspector must be a well-trained person and knowledgeable in the following aspects of his duties.
  - Clear-cut understanding about the provisions in the Seed Act, Seed Rules and Seed Control order etc., and all notifications relevant to his region.
  - Knowledge of the kinds and varieties notified for his region
  - Thorough with the seed standards and the minimum limits prescribed for different crops in Indian Minimum Seed Certification Standards.
  - Ability to identify agricultural and horticultural seeds, objectionable and harmful weed seeds and other common weed seeds, and varieties of agricultural and horticultural seeds that can be identified readily.
  - Thorough with the principles and procedures of seed sampling, division and submission of samples and knowledge of seed testing laboratory procedures and reports
  - Have enough knowledge about all forms and details related to sampling, dispatch of samples, stopping and revoke of seed sales order, seizure and related legal action.
  - Have sufficient knowledge about seed production, certification, processing, storage and marketing.
  - Undergo periodic training programmes and refresher courses

- New Inspectors should undertake on-the-job training and should work with more experienced Inspectors for a period to gain sufficient field experience.

### Powers of Inspector

- Seed Inspector may draw representative samples from the seed lots of any person selling, offering to sell, keeping for sale, bartering, conveying, delivering or preparing to deliver such seed of any notified kind or variety. He may also draw samples after the delivery of such seed to a purchaser or consignee, if the container from which sample is to be drawn is intact.
- The representative sample must be sent for analysis, to the Analyst for the region within which the sample has been drawn.
- He may enter any place in which he has reason to believe that an offence under the Act has been or being committed and search at all reasonable times, with such assistance, if any, as he considers necessary. He may issue a stop sale order and ordering the possessor of such seed not to dispose of the concerned seed lot for a specific period not exceeding 30 days, if the offence is such that it can be removed or corrected. This provide time to the possessor of seed to correct the defect(s) and intimate such action to the Inspector. If the Inspector satisfied about the removal of the defect(s) shall revoke the stop sale order. If the defect(s) cannot be removed or corrected, the inspector may issue a seizure order in Form-IV of the Rules, and seize the seed lots.

#### FORM IV

To,

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The records detailed below have this day been seized by me under the provisions of clause (4) of sub-section (1) of Section 14 of the Seeds Act, 1966 (No. 54 of 1966) from the premises of

\_\_\_\_\_  
\_\_\_\_\_  
situated at \_\_\_\_\_  
Place \_\_\_\_\_  
Date \_\_\_\_\_

Seed Inspector

*Details of records seized*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date \_\_\_\_\_

Seed Inspector

- He has power to break open the door of any premises where any seed of any notified kind or variety may be kept for sale if the owner or any person in occupation of the premises, in spite of being present, refuses to open the door even upon request made by the Inspector.
- Any container may be broken by Inspector which contains any seed of any notified kind or variety.

- Any record, document, register or any other material object found in any place may be examined by Seed Inspector. He may issue a seizure order in Form-IV of the Rules and seize the records, if he has reason to believe that the records etc., may furnish evidence of the commission of an offence punishable under the Act.
- He may search or seize seed stock(s) and/or record(s) under the Criminal Procedure Code, 1898. The relevant provisions of the Criminal Procedure Code 1898 (5 of 1898) regarding search of house suspected to contain stolen property, forged documents, etc.

### Duties of Inspector

- Seed Inspector shall give notice in writing in Form-VI of the Rules, to the person from whose seed lots he intends to take samples, whenever he intends to take sample of any seed of any notified kind or variety for analysis. When he draws sample(s), minimum two persons to be present as witnesses and sign in Form-VIII of the Rules. He shall also remove five original labels from each lot and replace them by labels duly authenticated by the Department of Agriculture. Alternatively, if five spare labels identical to those on the seed containers under sampling are available with the person from whose seed lot sample is drawn, he may obtain these spare labels from the person.

#### FORM VI

To \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I hereby give you the notice of my intention of taking a sample of seed from your stocks for the purposes of tests or analysis.

Date \_\_\_\_\_

Seed Inspector

#### Form VIII

To \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I have this day taken from the premises of \_\_\_\_\_ situated at \_\_\_\_\_  
\_\_\_\_\_ samples of seeds specified below to have the same tested/  
analysed by Seed Analyst.

Date \_\_\_\_\_

Seed Inspector

#### Details of samples taken

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Whether cost of sample demanded?

Cost of sample \_\_\_\_\_ Rs. \_\_\_\_\_ paid.

Date \_\_\_\_\_

Seed Inspector  
Area

Signature of the party from whose premises samples taken and payment made.

The representative sample drawn by Seed Inspector shall be randomly divided in to three equal and identical parts and:

- a. One sample will be delivered to the person from whose seed lots the sample has been drawn;
- b. Second sample will be sent along with Form-V of the Rules for analysis to the Analyst for the area within which the sample has been drawn; and
- c. The third sample will be retained for production in case any legal proceedings are taken or for analysis by the Central Seed Laboratory if the accused vendor or the complainant makes an application to the court for sending the sample retained by the Inspector to the Central Seed Laboratory for its report.

The principles and procedure for sampling, mixing, dividing, preparation and dispatch of samples are enumerated in green book.

#### FORM V

Memorandum to Seed Analyst.

Serial No. of Memorandum.

From: \_\_\_\_\_

To

The Seed Analyst  
\_\_\_\_\_

The sample described below is sent herewith for test and analysis under clause (b) of sub-section (1) of section 14 and/or clauses (b) and (c) of sub-section (2) of Section 15 of the Seeds Act, 1966.

1. Serial No. of the sample.
2. Date and place of collection.
3. Nature of the articles submitted for analysis/test.
2. A copy of this memo and specimen impression of the seal used to seal the packet of samples is being sent separately by post/hand.\*

Date \_\_\_\_\_

Seed Inspector

\*Strike out whichever is not applicable

Area \_\_\_\_\_

- Sometime the person from whose seed lot the samples have been drawn refuses to accept one of the samples. It has to be intimated to the Analyst and the samples so refused by the person has to be send to the Seed Analyst. After doing proper mixing and dividing the sample will be divided into two equal and identical parts by Analyst and after sealing or fastening, one of the samples has to be delivered to the Inspector's control. That will be retained by Inspector for production in case legal proceedings are taken.
- Based on the necessary, the seed samples will be procured and send for analysis by the Inspector which he has reason to suspect and kept for sale in the seed market.
- He shall satisfy himself that the conditions laid down by the certification agency are being observed in regard to issuance and revalidation of certificate.



- The cost of the seed sample has to be paid by the Inspector, on demand to the person from whose seed lot the sample is collected.
- He shall, as soon as possible, inform and take orders from magistrate for the custody of the seized stock, records, registers, documents or material object provided it furnishes evidence for commitment of offence.
- He shall be prompt in ascertaining whether or not the seed contravenes the provisions of the Act and the Rules and if it is ascertained that the seed does not contravene the provisions, revoke the order passed under Section-14 (1)(c) and take such action as may be necessary for the return of the stock of the seed and/or record(s) seized.
- He shall inspect as frequently as may be necessary all places used for storage or sale of any seed of notified kind or variety.
- He shall investigate any complaint, which may be made to him in writing in respect of any contravention of the provisions of the Act and/or Rules.
- He shall maintain a record of all inspections made, and action taken by him in the performance of his duties, including the taking of samples and the seizure of stocks; and submit copies of such record to the Director of Agriculture or to such authority as may be directed in this regard.
- He shall, when so authorized by the State Government, detain imported containers, which contravene the provisions of the Act.
- In the case of persistent defaults, or obvious infringement of the provisions of the Act and the Rules, he should promptly institute prosecution.

#### **Mobility of and seed storage arrangements with Inspector**

- Two important needs for Inspectors are mobility and storage space for seed samples. Mobility is vital for the success of the seed law enforcement programme. It is essential that Inspectors are provided with suitable facilities for quick movement.
- The storage of seed samples retained by the Inspector is his responsibility. However, recognizing his limitations in the location where he is working, it is recommended that the laboratory may arrange for suitable storage of all the Inspector's samples. The officer to whom the inspector is subordinate should ensure that the Inspector's samples are stored in a proper manner in a suitable location. Storage space should be such that the viability of the seed is maintained for a reasonable period of time, at least one year.

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## **Case Study of Seed Related Issues and the Essential Commodities Act, 1955 with reference to Seed**

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Agriculture is the lifeline of majority population in India. It is an established fact that good quality seed is a pre-requisite for optimum return from the crop. Seed is the cheapest input and forms only a small fraction of cultivation expenses. Improved seed encourages the use of modern production technology and continuous supply of good quality seed is therefore, essential for maintaining tempo of revolution in agriculture.

Most of the agriculturally advanced countries have legislative measures governing the quality of seed sold to the farmers. The Jammu & Kashmir Vegetable Seeds Act, 1952 was the first legislative measure on seeds in India. In order to supply good quality seeds to the tillers of the land and to protect the honest seed dealers, it was considered necessary to enact suitable legislation for the country.

The seed legislations in the country were enacted at different points of time through which Government has strived to ensure the right quality seeds are sold to the farmers so that the targeted production of food grains can be achieved and farmers get due return for their hard work. The Seeds Act, 1966 was enacted to provide for regulating the quality of certain seeds for sale, and for matters connected therewith. The Seeds (Control) Order, 1983 was made under the Essential Commodities Act, 1955 to evolve a mechanism for licensing the seed dealers and for seed law enforcement.

The root of the Essential Commodities Act, 1955 can be traced back to 1939 when, the Government of India made rules regarding control, production, supply and distribution of certain specific commodities under the Defence of India Act, 1939 during World War II. The Act ceased to exist in 1946. However, it was felt that certain regulations are needed urgently for the protection of some essential commodities in the interest of general public. Therefore, the Essential Supplies (Temporary Powers) Ordinance came to operation in 1946 which was subsequently replaced by the Essential Supplies (Temporary Powers) Essential Supplies (Temporary Powers) Act, 1946.

The provisions of the Act were further extended by two resolutions of the General Assembly in 1948 and 1949. After independence by the 3<sup>rd</sup> Constitutional Amendment, the first Essential Commodities Ordinance was passed, which was subsequently replaced by the present Act namely, the Essential Commodities Act, 1955.

The Essential Commodities Act, 1955 came into force from 1<sup>st</sup> April, 1955 with the objectives of providing the control of the (i) Production, (ii) Supply and (iii) Distribution of, and trade commerce in certain commodities, in the interest of general public.

Further the Act aims at (i) to maintain or increase the supplies of any essential commodity and (ii) to secure equitable distribution and availability the essential commodities at fair prices.

According to the Act, the commodities included in the "Schedule" of the Act are essential commodities for the purposes of the Act. The "Schedule" includes (1) Drugs, (2) Fertilizer, whether inorganic, organic or mixed, (3) Foodstuffs including edible oilseeds and oils, (4) hank yarn made wholly from cotton, (5) Petroleum and petroleum products, (6) Raw jute and jute textiles, (7) (i) Seeds of food-crops and seeds of fruits and vegetables, (ii) Seeds of cattle fodder, (iv) Jute seeds and (v) Cotton seed.

The term "foodstuff" is not defined anywhere in the Essential Commodities Act, 1955. However, the scope of this term had been developed various case studies such as: Satpal Gupta V. State of Haryana: In this case, it was established that cattle and poultry foods are included within the meaning of the foodstuffs. Therefore, it was concluded that the foodstuff is related to both humans and animals.

In the case, State of Bombay V. Virkumar Gulab Chan Shah (AIR 1952 SC 335) it was established that the foodstuff includes raw materials used in the process and preparation of food. Therefore, turmeric has been included in the scope of foodstuff.

In the case of S. Samuel, M.D., Harrisons V. Union of India (2004 SSC 256) it was decided that tea is not a foodstuff and merely a stimulant. It is neither used in the preparation of food nor contains any nutritional value. And in general parlance also when a person tea does not consider it as having food.

The section 3 of the Essential Commodities Act, 1955 Central Government has the power to issue Control Orders which provide for regulation and prohibition of essential commodities scheduled in one of the following circumstances:

(1) When the Central Government finds that it is necessary and expedient to do in favor of the general public. (2) When the Central Government has to secure equitable distribution and availability of these commodities in the market and (3) When the Central Government has to secure any specific commodity for the Defence of India.

The purposes of any Control Order are to (1) regulate by License, permit or otherwise, (2) to bring under cultivation of any waste land or arable land, (3) to control the buying and selling price of any essential commodity, (4) to determine entry, search, examine, detention, seizure of any essential commodity, (5) to require any person to do specific works and (6) to regulate or prohibit any class of commercial and financial transactions.

There is provision of penalties under section 7 of the Essential Commodities Act, 1955. There are different kinds of penalties imposed upon different kinds of offences. As per section 7, a person who contravenes any order under section 3, shall be punishable with imprisonment for a term varying from 3 months to 7 years depending upon the offence, or

shall also be liable to fine or both as may be decided by the Court of Law. In addition, the property of the person who contravened the provisions of the act may also be forfeited.

The Essential Commodities Act, 1955 is one of the important laws of the country that applies for the protection of the interest of the general public. Under this Act, the Central Government possesses a wide range of powers to control the production and supply of essential commodities. Under this Act, the Central Government controls the price of the confiscated or seized essential commodities. All these powers are necessary to maintain the market.

Case Study: The Essential Commodities Act, 1955. In this case, the applicant was the dealer of food grains at Dhar in Madhya Pradesh. He was prosecuted for having in stock 885 maunds (one maund is equivalent to 37kg) and 21/4 seers (one seer is equivalent to 1.25kg.) of wheat without a license for the purpose of sale thereby committed an offence under Section 7 of essential commodities Act, 1955. The appellant pleaded that he did not intentionally contravene the provision of the Act; he said that he stored the goods after applying for the license and he was fully convinced by the government authorities that it would be issued to him.

In this case, it was held that the mere fact that the nature of the statute is to promote welfare activity and eradicate the social evil itself does not exclude mensrea from its ambit. The elements of mensrea excluded from any statute only if it defeats the object to such a statute. Thus when we read the object of the Essential Commodities Act which is "to control trade in certain commodities for the interest of the general public" we cannot say that this would be defeated if the mensrea is read like an ingredient of offences committed under it. Therefore an offence under Section 7 would be committed only if a person intentionally contravenes the provision of Section 3 of the Act. However, in this case, the appellant successfully proved that he had no guilty intention at the time of having stored the seized essential commodities however despite having contravening of the order issued under Section 3 he was not prosecuted for this offence.

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# Field Inspection in Seed Certification-An Overview

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## Details of Establishment & Names of Rajasthan State Seed Certification Agency

- 1977-78 Rajasthan State Seed Certification Agency (RSSCA) IMSCS
- 2005-06 ROCA
- 2007 RSSOPCA (RSSCA + ROCA)
- 2018 RSSOCA

## Category of Quality Seed

- 1. Certified Seed where certification is compulsory
- 2. Labeled seed where certification is not compulsory but labeling is compulsory
- Types of Seed
  1. Nucleus seed
  2. Breeder seed (Yellow label)
  3. Foundation seed (White Tag)
  4. Certified seed (Blue Tag)

## Details of Seeds Act, 1966

Seeds Act 1966 \_ Section 5 - Notification of Varieties  
Seeds Act 1966 \_ Section 6 - Labeling of Seed  
Seeds Act 1966 \_ Section 7 - Regulation of Sale of Seeds of Notified Kinds or Varieties  
Seeds Act 1966 \_ Section 8 - Establishment of Seed Certification Agency  
Seeds Act 1966 \_ Section 9 - Grant of Certificate by Certification Agency  
Seeds Act 1966 \_ Section 10 - Revocation of Certificate  
Seeds Act 1966 \_ Section 11 - Appeal

## GENERAL SEED CERTIFICATION STANDARDS

The General Seed Certification Standards are applicable to all crops which are eligible for certification, and with field and seed standards for the individual crops, shall constitute the Minimum Seed Certification Standards. The word 'Seed' or 'seeds' as used in these standards shall include all propagating materials

### I. Purpose of Seed Certification

The purpose of seed certification is to maintain and make available to the public, through certification, high quality seeds and propagating materials of notified kind and varieties so grown and distributed as to ensure genetic identity and genetic purity. Seed certification is also designed to achieve prescribed standards

II. ~~Certification Agency~~ Certification shall be conducted by the Certification Agency notified under Section 8 of the Seeds Act, 1966.

III. Certified Seed Producer Certified seed producer means a person/organization who grows or distributes certified seed in accordance with the procedures and standards of the certification.

IV. Eligibility Requirements for Certification of Crop Varieties Seed of only those varieties which are notified under Section 5 of the Seeds Act, 1966 shall be eligible for certification.

## Classes and Sources of Seed

A. Breeder Seed Breeder seed is seed or vegetative propagating material directly controlled by the originating or sponsoring plant breeder of the breeding programme or institution and/or seed whose production is personally supervised by a qualified plant breeder and which provides the source for the initial and recurring increase of Foundation seed.

Breeder seed shall be genetically so pure as to guarantee that in the subsequent generation i.e. certified Foundation seed class shall conform to the prescribed standards of genetic purity. The other quality factors of Breeder seed such as physical purity, inert matter, germination etc. 13 shall be indicated on the label on actual basis. The Breeder seed shall be packed and supplied by the breeders in the form and manner indicated in Appendix-I.

**B. Certified Seed** Certified seed shall be the seed certified by Certification Agency notified under Section 8 of the Seeds Act, 1966 or seed certified by any Certification Agency established in any foreign country provided the Certification Agency has been reorganized by the Central Government through notification in the Official Gazette. Certified seed shall consist of two classes, namely, Foundation and Certified seed and each class shall conform to the following description: 1. Certified Foundation seed shall be the progeny of Breeder seed, or be produced from Foundation seed which can be clearly traced to Breeder seed. Thus, Foundation seed can even be produced from Foundation seed. During the production of certified Foundation seed, the following guidelines shall be observed:

**B. Certified Seed** Certified seed shall be the seed certified by Certification Agency notified under Section 8 of the Seeds Act, 1966 or seed certified by any Certification Agency established in any foreign country provided the Certification Agency has been reorganized by the Central Government through notification in the Official Gazette. Certified seed shall consist of two classes, namely, Foundation and Certified seed and each class shall conform to the following description: 1. Certified Foundation seed shall be the progeny of Breeder seed, or be produced from Foundation seed which can be clearly traced to Breeder seed. Thus, Foundation seed can even be produced from Foundation seed. During the production of certified Foundation seed, the following guidelines shall be observed:

- vegetatively propagated crops;
- apomictically reproduced crops;
- self-pollinated crops;
- often cross-pollinated and cross-pollinated crops, these being gene-pools should not lose their genetic identity and purity if measures to safeguard the same are adequately taken;
- composite and synthetics;
- parental line increase of hybrids.

2. Production of Foundation seed stage-I and II shall be supervised and approved by the Certification Agency and be so handled as to maintain specific genetic identity and genetic purity and shall be required to conform to certification standards specified for the crop/variety being certified.

3. (a) Certified seed shall be the progeny of Foundation seed and its production shall be so handled as to maintain specific genetic identity and purity according to standards prescribed for the crop being certified; (b) Certified seed may be the progeny of Certified seed provided this reproduction does not exceed three generations beyond Foundation seed stage-I and - it is determined by the Certification Agency that genetic identity and genetic purity will not be significantly altered; - and when the Certification Agency is satisfied that there is genuine shortage of Foundation seed despite all the reasonable efforts made by the seed producer. (c) Certification tag shall be of blue colour (shade ISI No. 104 AZURE BLUE) for Certified seed class. (d) Certified seed produced from Certified seed shall not be eligible for further seed increase under certification. Certification tags for such production which is not eligible for further seed increase under certification shall be super scribed with, "not eligible for further seed increase under certification". V

**VI. Phases of Seed Certification** Certification shall be completed in six broad phases listed as under:

- receipt and scrutiny of application
- verification of seed source, class and other requirements of the seed used for raising the seed crop;
- field inspections to verify conformity to the prescribed field standards;
- supervision at post-harvest stages including processing and packing;
- seed sampling and analysis, including genetic purity test and/or seed health test, if any, in order to verify conformity to the prescribed standards; and
- grant of certificate and certification tags, tagging and sealing.





### Breeder Seed Label & Seed Producer Label



### WHY INSPECTIONS ARE NECESSARY

The primary objective in conducting field inspections is to confirm that seed produced from a crop grown for seed purpose is of the designated variety, and that it has not been contaminated genetically and/or physically beyond certain specified limits. Genetic contamination of a seed crop is prevented by permitting pollination by pollen from a specific desirable source recognized as the pollinator, and conversely, by preventing pollination by pollen from an undesirable or unrecognized source, through controlled pollination, physical or mechanical contamination in the field is avoided by preventing admixture during sowing and harvesting. Field inspections ensure that steps necessary to overcome genetic and physical contamination have been taken in time to make them effective.

### The objective of field inspection is fulfilled by verifying that the seed crop is:

- Raised from seed whose source is approved.
- Grown on a field area which satisfies the prescribed land requirements as to previous crop (s), to prevent contamination by volunteer plants and disease spread by pathogens.
- Provided with the prescribed isolation and/or with the prescribed number of border rows in hybrid seed production.
- Planted in the prescribed ratios of female (seed) and male (pollinator) parents in the case of hybrid seed production.
- Properly rogued to remove contaminating factors such as pollen shedders in bajra and sorghum, shedding tassels in maize, crosses, off types, diseased plants/ears, objectionable weeds, and inseparable other crop plants so as to conform to the standards prescribed for these factors.

- True to the varietal characteristics descriptive of that variety. Harvested properly to avoid mechanical admixture.
- Grown in compliance with other special requirements for the crop concerned.

The field observations made for these are compared with a set of prescribed norms called the Minimum Seed Certification Standards which are specific for each crop. The Minimum Seed Certification Standards specify the requirements for seed crops as to previous crops, isolation, varietal purity, other crop plants, objectionable weeds and freedom from certain designated diseases. They also specify the requirements for seed lots for physical qualities including pure seed, inert matter, other crop seed, weed seed, and objectionable weed seed, and for germination and entitled the "Indian Minimum Seed Certification Standards", published in September, 2013.

### WHO SHOULD INSPECT WHAT

The authority of an agency to inspect a seed crop depends basically on whether the inspection is for certification under the Seeds Act 1966 or is only to assure production of high-quality uncertified seed. If the inspection is for official certification, only the officially notified agency for the concerned region under the Act, has the authority to perform the inspection. If the inspection is only to ensure high quality in uncertified seed, any qualified agency such as the seed producing or contracting agency may make the inspection.

If the inspection is for certification under the Act, the seed crop should be of the variety eligible for such certification. If the inspection is only to ensure high quality in uncertified seed any crop recognised by the qualified agency as for seed production can be inspected.

### FIELD INSPECTION

#### GENERAL GUIDE LINES

Procedure for field inspections differ among crops and among growth stages of the same crop. The following broad principles on inspection methods are common to most crops and stages of growth.

- The number of inspections indicated in MSCS are the minimum and should be conducted at proper stage.
- The inspecting officer should ensure that he is guided by the producer to the correct seed field.
- Inspection of cross-pollinated crops at and after commencement of flowering should be made without prior intimation to the producer.
- The producer or his representative should be requested to accompany to the field during the entire inspection and they be shown all the factors observed in the field and which will be recorded in the inspection report.

5. When seed fields of the same class/variety of the same producer are separated by less than 50 meters they can be considered as one field unit for inspection provided they are of same growth stage and level of conformity to standards. If they are separated by more than 50 meters, a separate inspection report shall be made for each unit.
6. It is compulsory to observe it and its border areas before entering the fields, especially in tall crops like Bajra, Sorghum, Mustard etc. and crops requiring sizeable isolation distances around the outer boundary of the seed fields.
7. If one third or more of a self pollinated/cross pollinated crop is so lodged that taking counts is difficult, the seed crop may be recommended for rejection.
8. Walk through the entire seed field while taking field counts (it should not be localized to a portion or a few portions of a field) it should be randomly distributed all over the field.

9. If the plant population in a field is so thin that the entire population is less than the number of counts required entire population may be counted.
10. Counting may be started from any pointed of the seed field but spotting a defect and trying to include/avoid it in the counts, is not desirable.
11. Factors counted during inspection need not normally be pulled out, but be shown to the seed grower/farmer to rogue out such plants.
12. If plants/heads of the designated factors which were pulled out by the producer are lying on the ground within out skirts of the seed field, the producer should be directed to collect and remove them from the field.
13. If the seed field is found to be liable for rejection either in part or in full on account of inadequate isolation, the prescribed number of field counts for the entire are still to be taken for that inspection.

14. A seed crop liable to be partially rejected due to inadequate isolation, further inspection of the entire field (including the affected portion) should be continued according to the prescribed number and procedure and separate counts for the affected area should be mentioned in the inspection report.
15. If on the basis of first set of field counts, the seed crop does not conform to the prescribed standards for any factor, a second set of counts should be taken for the concerned factor, provided the percentage of the first set of counts for that factor is more than maximum permissible limit but not more than twice the maximum permissible limit.
16. For seed crops involving two parental lines, even if two sets of counts in one parental line show that the field does not conform to the prescribed standards it is necessary to take counts in the other parental line.

17. If on the basis of two set of counts the seed crop does not conform to the prescribed standards, further inspections need not be made unless the seed crop is eligible for re-inspection (after removal of contaminating factors). If the seed crop is not eligible for such re-inspection then LIABLE FOR REJECTION and final inspection should be recorded in the inspection report.
18. If the factor present beyond the maximum permissible limit as verified by two sets of counts could not have already caused contamination of the seed crop or when contamination has already taken place; if removal of contaminating factors and contaminated materials could make the seed crop conform to the prescribed standards, their removal from the field may be recommended to permitted. Re-inspection to conform removal and conformity to standards must then be made when re-inspection is permitted and it should be shown in the inspection report.
19. Observations made during field inspection shall be directly recorded on inspection report on the spot and the signature of the cultivator or his representative on the field should be obtained on all copies of inspection report and, if he refuses to sign then it should be indicated in the inspection report as "Refused to Sign".

MINIMUM NUMBER OF FIELD INSPECTION AND STAGES OF INSPECTION REQUIRED FOR CERTIFICATION			
Sr.No	Crop	Number of Inspections	Stages of Inspection
1	2	3	4
1.	Ragi, Paddy, Wheat, Cowpea, Greengram, Blackgram, Redgram, Groundnut, Soyabean, Frenchbean, Amaranthus	2	Flowering to harvest
2.	Maize (a) Inbred line, single crosses and hybrids (a) Composites, Synthetics and open pollinated varieties	4 2	First before Flowering and three during silking stage First pre-Flowering and second during Flowering
3.	Hybrid Sorghum, Hybrid Bajra, Hybrid Sunflower and their parents	4	First before Flowering, second and third during Flowering & fourth during pre-harvesting

Sr.No.	Crop	Number of Inspections	Stages of Inspection
1	2	3	4
4.	Open pollinated varieties of Sorghum, Bajra, Sunflower, Safflower, Sesamum and jute	3	First pre-Flowering, second during Flowering & third during pre-harvesting
5.	Cotton (a) Hybrids (a) Varieties	4 2	First before Flowering. Second and third during Flowering (Emasculation and crossing) fourth during picking of bolls. Flowering to harvest
6.	Castor (a) Hybrids (a) varieties	4 2	1 <sup>st</sup> before Flowering 2 <sup>nd</sup> and 3 <sup>rd</sup> during Flowering 4 <sup>th</sup> at pre-harvest Flowering to harvest



Sr.No.	Crop	Number of Inspections	Stages of Inspection
7.	Dhaincha	2	1 <sup>st</sup> before Flowering 2 <sup>nd</sup> at flowering and pod stage
8.	All cucurbits and fruit vegetables (other than hybrids) viz. Brinjal, Bhindi, Tomato, Chillies, Capsicum	3	1 <sup>st</sup> pre-Flowering. 2 <sup>nd</sup> during Flowering and fruiting. 3 <sup>rd</sup> during mature fruit stage
9.	Potato	3	1 <sup>st</sup> 45 days after sowing. 2 <sup>nd</sup> just before haulm cutting. 3 <sup>rd</sup> after haulm cutting.
10.	Radish, Carrot and Turnip	3	1 <sup>st</sup> 20-30 days after sowing. 2 <sup>nd</sup> when lifted & replanted. 3 <sup>rd</sup> flowering.
11.	Cumin, Coriander and Fennel	3	1 <sup>st</sup> before Flowering 2 <sup>nd</sup> 50% Flowering 3 <sup>rd</sup> Maturity

#### WHEN TO INSPECT

The field inspection offered for seed certification are conducted at following stages :

- (1) Vegetative or pre-flowering stage.
- (2) Flowering stage.
- (3) Post flowering and pre-harvest stage.
- (4) Harvest stage.

#### FIELD COUNTS

1. The number of counts taken and the method of taking counts vary from crop to crop for all crops; five counts are taken for any area upto 5 Acre and an additional count is taken for every additional 5 Acre as given below :

Area of the field-crops	No. of Counts to be taken
Up to 5 acres	5
Above 5 to 10 acres	6
Above 10 to 15 acres	7
Above 15 to 20 acres	8
Above 20 to 25 acres	9
Above 25 to 30 acres	10

In any inspection if the first set of counts shows that the said crop does not conform to the prescribed standards for any factor, a second set of counts shall be taken for the factor. However, when the first set of counts shows a factor to be more than twice the maximum permitted, it is not necessary to take a second set of counts. Two sets of counts are called double counts.

In any inspection if the first set of counts shows that the said crop does not conform to the prescribed standards for any factor, a second set of counts shall be taken for the factor. However, when the first set of counts shows a factor to be more than twice the maximum permitted, it is not necessary to take a second set of counts. Two sets of counts are called double counts.

2. Taking double sets of counts for a factor is :
  - a) Necessary if in the first set of counts occurrence of the factor is more than the maximum permitted, but not more than twice the maximum permitted.
  - b) Necessary if in the first set of counts occurrence of factor is equal two twice the maximum permissible level.
  - c) Not necessary if in the first set of counts occurrence of the factor is less than or equal to the maximum permitted.
  - d) Not necessary if in the first set of counts occurrence of the factor is more than twice the maximum permitted.

Number of plants to be counted per count :			
S.No.	Crop	No. of plants/ heads per count	Remarks
1.	Bhindi, Brinjal, Bulb crops Capsicum, Castor, Chilli, Colecrops, Cotton, Cucurbits, Maize, Groundnut, Potato, Redgram, Root crops, Teosinte, Tomato	100 plants	wide spaced and non tillering
2.	Beans, Cowpea, Gram, Leaf crops, Moong, Mustard, Peas, Sesamum, Sunhemp, Sunflower, Blackgram, Green Gram, Lentil, Niger	500 plants	Medium spaced and mon tillering
3.	Berseem, Jute, Lucerne, Mesta, Soyabean	1000 plants	Medium spaced and line sown
4.	Bajra, Barley, Oats, Paddy, Sorghum, Wheat, Ragi millets	1000 heads	Tillering crops

3. All plants or heads falling in each count must be examined for each designated factor as per MSCS.
4. If the seed field is planted with two different parents, the prescribed number of counts must be taken separately for each parent.
5. Percentage for deciding acceptance or rejection is calculated only to the number of decimals in which the standard is expressed.

### WHAT TO INSPECT

Basically sources of genetic and physical contamination must be observed and extent of their occurrence estimated.

Sources of contamination can broadly be classified as follows :

#### A. OFF TYPES

Off types are the plants of the same species as that of the seed crop variety but morphologically of different characters eg. pigmentation, plant type, stem/ leaf shape and texture, size/colour of flower or fruit etc.

Similarly plants of other varieties of same crop are also included in off types. To designate a plant as off type it is necessary to trace it to any variety.

#### B. INSEPARABLE OTHER CROP PLANTS

Such type of plants whose seeds are similar in size, colour etc. and are difficult to separate from the seeds of seed crop by mechanical means are inseparable other crop plants. Such plants are counted if the growth stage of these plants is such that the maturity time resembles to the seed crop and may cause mechanical admixture at the time of harvesting/threshing.

Crop	Designated Inseparable other crops
Barely	Oats, Wheat and Gram
Oats	Barely, Wheat and Gram
Wheat	Barely, Oats and Gram

### C. OBJECTIONABLE WEED PLANTS

The plants of weed species harmful in the following ways :

- Size/ shape of seeds are similar to crop seed which are difficult to remove by mechanical means.
- Growth habits has detrimental or competing effects on crop plants.
- Mode of spread, perpetuation, perennation or growth habit make eradication difficult.
- Plant parts are poisonous/injurious serves as alternate host for pests and diseases. Such plants are counted if the growth habit is similar to the seed crop thus causing admixture at the time of harvesting/threshing.

#### Crop

Paddy  
Rape, Mustard  
Cucurbits  
Okra (Bhindi)  
Lettuce  
Berseem  
Lucerne  
Methi

#### Designated objectionable Weeds

Wild rice or red rice (Oryza sativa var)  
Satanashi (Argemone mexicana)  
Wild Cucurbits Spp.  
Wild Abolmoschus spp.  
Wild Lettuce (Lactuca serriola)  
Chicory or Kasni (Cichorium intybus)  
Dodder (Cuscuta spp)  
Senji (Mehilotus spp)

### D. DISEASES

Seed may carry seed borne, soil or air borne diseases. Economical and effective measures of some seed borne diseases are available. However, counts of each designated diseases should be mentioned in the inspection report.

### E. ISOLATION

A proper designated isolation distance is compulsorily be maintained in the seed fields. All precautions should be taken so that produce of rejected area of the seed field on account of isolation is not mixed with that of the certified seed field. Threshing certificate if required may be given.

### MINIMUM ISOLATION REQUIREMENTS FOR FIELD CROPS

Sl. No.	Crop	Minimum distance (In Meters) Foundation	Isolation Certified	To be isolated by the distance in column 3 or 4 from fields of
1	2	3	4	5
1.	Paddy, Wheat, Ragi Barley, Groundnut, Soyabean	3	3	Other varieties; the same variety not conforming to varietal purity requirements for certification.
		150	150	For loose smut susceptible wheat from affected plants

Sl.No	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
2.	Maize (a) Inbred Line & Single crosses	400	-	Any maize with same kernel colour and texture, same inbred/single cross not conforming to varietal purity requirements for certification.
		600	-	Any maize with different kernel colour and texture.
	(b) Hybrids	-	200	Any maize kernel colour and texture colour same as that of seed parent.
		-	300	Maize of the same cross not conforming for certification.
	(c) Composite Synthetics and open pollinated varieties.	400	200	Any Maize with kernel colour or texture different from that of the seed parent.
				Other varieties, the same variety not conforming to varietal purity requirements for certification.



Sl. No.	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
3.	Sorghum (a) Hybrids	300	200	Other varieties of grain or dual purpose Sorghum, the same variety not conforming to varietal purity requirements for certification. Johnson grass (Sorghum halepense) and forage sorghum with high tillering and grassy panicle. Sorghum hybrids with same male parent and conforming to varietal purity requirement for certification.
		400	400	
		-	5	
	(b) Open pollinated Varieties	200	100	Other varieties of grain or dual purpose & same variety not conforming to varietal purity requirement for certification. Forage sorghum with high tillering and grassy panicle, johnson grass (Sorghum halepense)
		400	400	

Sl. No.	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
4.	Bajra (a) Hybrids	1000	200	Other varieties, the same variety not conforming to varietal purity requirement for certification.
	(b) Open pollinated varieties	400	200	Other varieties, the same variety not conforming to variety purity requirement for certification.
5.	Cowpea, Green gram, Black gram, Bengal gram, Peas and beans	10	5	Other varieties and fields of same variety not conforming to the purity requirement for certification.
6.	Red gram	250	100	Other varieties and fields of same variety not conforming to the purity requirement for certification.

Sl. No.	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
7.	Sunflower (a) Hybrids	600	400	Fields of other varieties and fields of the same variety not conforming to the varietal purity requirement for certification and wild sunflower.
	(b) Varieties	400	200	
8.	Safflower and Niger	400	200	Fields of other varieties of the same kind or the same variety not conforming to the varietal purity requirement for certification.
9.	Castor	600	300	Other varieties of the same kind or not Varieties and hybrids conforming to the varietal purity requirement for certification
	Seed production by modified method	1000	300	Other varieties of the same kind or not conforming to the varietal purity requirement for certification.

Sl. No.	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
10.	Sesamum	100	50	Other varieties of the same kind or same variety not conforming to the varietal purity requirements for certification.
11.	Cotton (a) Parents of hybrids and varieties	50	30	Other varieties of the same species, fields of the same variety not conforming to the varietal purity requirements for certification, fields of other species. Between the block of the parental lines of the same hybrids.
	(b) Hybrids	-	5	
12.	Jute	50	30	Other varieties of the same variety not conforming to varietal purity for certification. Fields of other species.
		5	5	

Sl. No.	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
13.	Tomato Varieties	50	25	Other varieties of the same species not conforming to varietal purity for certification. Other varieties of the same species not conforming to varietal purity for certification.
	Hybrids	200	100	
14.	Bhindi	500	250	Fields of other varieties, the same variety not conforming to varietal purity requirements for certification and wild Abelmoschus spp.
15.	Capsicum and chilli	500	250	Other varieties, the same variety not conforming to varietal purity requirements for certification, chilli from capsicum and vice versa.
16.	Brinjal (a) varieties	300	150	Other varieties, the same variety not conforming to varietal purity requirements for certification.
	(b) Hybrids	200	200	

Sl. No.	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
17.	Potato	5	5	Other varieties, the same variety not conforming to varietal purity requirements for certification.
18.	Cluster bean	10	5	Other varieties, the same variety not conforming to varietal purity requirements for certification.
19.	Gourds (cucurbits) (a) Hybrids	1500	1000	Fields of varieties including commercial hybrid of the same variety. Variety and the variety/hybrid not conforming to varietal purity requirements for certification.
	(b) Varieties	1000	500	
20.	Amaranthus	400	200	variety and the variety/hybrid not conforming to varietal purity requirements for certification.

Sl. No.	Crop	Minimum distance Foundation	Isolation (meters) Certified	To be isolated by the distance in column 3 or 4 from fields of
21.	Mustard	200	50	Other varieties of Brassica, the same spp. & fields of the same variety not conforming to varietal purity requirement
	(a) Self Compatible	100	50	"do"
	(b) Self Incompatible	100	50	"do"
	(c) Fields of Rocket salad and any of the other spp. of Genus Brassica.			
22.	Fenugreek	50	25	Other Variety and the same
23.	Cumin	800	400	variety not conforming to
24.	Coriander	200	100	varietal purity requirement
25.	Fennel/Ajwain	200	100	for certification
26.	Dhaincha	10	05	"do"

#### REINSPECTION

For crops not conforming to the standards for certification at any inspection, the field may be reinspected by the Agency on producers or seed grower/farmers request on depositing reinspection fee, when he has removed the source of contamination in the seed field and has maintained the isolation distance and or the contaminated plants in the seed field. The Agency may conduct one or more reinspection over and above normal set of inspections to ensure conformity of the seed crop to the standards as per MSCS.

#### REPORTING RESULTS

The results of the field inspection must be reported in the prescribed inspection report of the Agency & is to be signed by the seed grower/farmer also. A copy is to be given to him on spot.

Sometimes, even after following all regulations and observing normal field counts, an officer may some times observe defects which do not come in field counts. Under such conditions he may follow the suggested procedure :

1. When patches or rows off types, shadders, shedding tassels objectionable weeds, inseparable other crop plants heads or plants affected by diseases are noticed but not come under field counts, separate observations such as size of the patch, number of rows etc. should be made, reported and be shown on a map. The officer should exercise discretion and attempt to save the crop from rejection by advising the grower to remove the defective patch before contamination occurs.
2. If the male/female parents in seed production involving two parents have been irregularly planted, it should be recommended as "LIABLE FOR REJECTION".
3. If the seed crop is grown as mixed, inter or companion crop other than prescribed norms, it should be recommended as liable for rejection.
4. If the seed crop has failed partially or completely or is damaged by cattle, flood, drought etc. or the producer does not want to offer it for certification, the inspection report should still be prepared.

#### HARVESTING

Seed crop meeting the field standards after final field certification shall be properly harvested, threshed, dried and transported to the registered seed processing plant as per crop calendar for processing and certification. during the above operations seed producer/growers should take all necessary precautions to safeguard the seed quality.

- (i) The Crop should be harvested at proper stage.
- (ii) It should be properly dried, threshed so that no admixture takes place at threshing floor.
- (iii) All thresher or bags should be clean, bags are not old and torned.
- (iv) All stones, stalks, mud balls etc. should be removed for better processing.
- (v) Bags should not be over filled & not more than 100 Kg. capacity.
- (vi) Care to be taken for Soyabean harvesting, threshing & packing.

**राजस्थान राज्य बीज एवं जैविक प्रमाणीकरण संस्था**  
**पंत कृषि मंदिर, जनपथ, जयपुर-302005** कृषाफ

**क्षेत्र निरीक्षण प्रपत्र (राजसू, गजरा, ज्वार, खरबूटी एवं कपास की संकर फसलों) के अतिरिक्त**

संस्था इकाई का नाम \_\_\_\_\_ दूरभाष / मोबाइल नं० (इकाई प्रभारी) \_\_\_\_\_

क्षेत्र क्रम संख्या \_\_\_\_\_ बीज उत्पादक संस्था का नाम \_\_\_\_\_  
सीजन- रबी \_\_\_\_\_ शरीरक \_\_\_\_\_ जात/प्रकार \_\_\_\_\_ फसल \_\_\_\_\_ किस्म \_\_\_\_\_ निरीक्षण दिनांक \_\_\_\_\_  
निरीक्षण संस्था- प्रथम / द्वितीय / तृतीय / अंतिम \_\_\_\_\_  
विस्तृत फसल इसी मौसम की \_\_\_\_\_ बुवाई की तिथि \_\_\_\_\_  
प्रदुषित कटाई की तिथि \_\_\_\_\_

1 बीज उत्पादक कृषक का पूरा नाम व पता \_\_\_\_\_

2 बीजे गये बीज फार्म का नाम व पूरा पता \_\_\_\_\_

क्षेत्र का महत्व किन्तु \_\_\_\_\_

3 बीजे गये बीज वर्ग- (अ) प्रजनक / अग्रसर / प्रमाणित (ब) श्रेणी-प्रजन / द्वितीय

4 प्रमाणित किए जाने वाले बीज का वर्ग-  
(अ) अग्रसर / प्रमाणित  
(ब) श्रेणी-प्रथम / द्वितीय / तृतीय

5 बीज फसल के अनुरूप आवंटित क्षेत्र \_\_\_\_\_ एकड़  
6 बीज गवा क्षेत्र \_\_\_\_\_ एकड़  
7 निरीक्षित क्षेत्र \_\_\_\_\_ एकड़

8 बीजे गये बीज का रबीत सत्यापन-  
(क) प्रजा की गयी बीज की मात्रा \_\_\_\_\_ ग्राम  
(ख) बीजे गये बीज की वास्तविक मात्रा \_\_\_\_\_ ग्राम  
(ग) सुचित किये गये बीज के लॉट नं \_\_\_\_\_  
(घ) गोलों पर पाये गये बीज के लॉट नं \_\_\_\_\_  
(ङ) गोलों पर पाये गये बीज (संख्या) \_\_\_\_\_ टैग्स (संख्या) \_\_\_\_\_

9 प्रत्यक्षकरण- \_\_\_\_\_ संतोषजनक / असंतोषजनक

10 निरीक्षण की समय-  
(क) बीज फसल की अवस्था- पूर्वपुष्पावस्था / पुष्पावस्था / परिपक्वता  
(ख) प्रदुषण की स्थिति में प्रदुषक फसल की अवस्था- पूर्वपुष्पावस्था / पुष्पावस्था / परिपक्वता

11 बीज फसल की स्थिति- \_\_\_\_\_ कमजोर / औसत / अच्छी / बहुत अच्छी

12 किस प्रकार का बीज उत्पादन कार्यक्रम चलाया गया है-  
संतोषजनक / असंतोषजनक

13 क्या यह अंतिम निरीक्षण प्रपत्र है- \_\_\_\_\_ हाँ / नहीं

14 फसल प्रमाणीकरण के योग्य है- \_\_\_\_\_ अभी नहीं / हाँ / नहीं

15 निरस्त क्षेत्र-  
(अ) प्रत्यक्षकरण असंतोषजनक के कारण \_\_\_\_\_ एकड़  
(ब) अवांछित/रोग ग्रस्त/अन्य अभिनेद्य पौधों के कारण \_\_\_\_\_ एकड़  
(स) अन्य कारण \_\_\_\_\_ एकड़  
(द) कुल निरस्त क्षेत्र \_\_\_\_\_ एकड़

16 अंतिम प्रमाणित क्षेत्र \_\_\_\_\_ एकड़

17 अनुमानित उपज \_\_\_\_\_ क्व./एकड़  
(यदि अनुमानित उपज सामान्य से अधिक लिखी जाती है तो उसका कारण स्पष्ट रूप से अंकित किया जाये)

**विशेष विवरण- दिये गये दिशा-निर्देश-**

1. बताने अनुसार अवांछित / रोगग्रस्त पौधे निकाल दिये।  
2. प्रत्यक्षकरण के कारण निरस्त क्षेत्र जलम कटवाये।  
3. फसल कटाई करना सवाले है।  
4. बीज फसल कटाई व गहवाई के समय निरीक्षण न होने दें।  
5. \_\_\_\_\_  
6. \_\_\_\_\_

18 क्या बीज उत्पादक / प्रतिनिधि निरीक्षण के समय उपस्थित था- \_\_\_\_\_ हाँ / नहीं

हस्ताक्षर बीज उत्पादक/प्रतिनिधि \_\_\_\_\_ निरीक्षण अधिकारी के हस्ताक्षर \_\_\_\_\_  
(प्रतिनिधि की स्थिति में बीज उत्पादक से सलाह ली जाये)

नाम- \_\_\_\_\_ नाम- \_\_\_\_\_  
मुख्यालय प्रपत्र \_\_\_\_\_ पद- \_\_\_\_\_  
पता- \_\_\_\_\_ पता- \_\_\_\_\_

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# Seeds Act and Rules in Relation to Seed Testing

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Seed testing helps to assess the quality attributes of the seed lots which have to be offered for sale and minimize the risk of planting low quality seeds, thus assume importance for all those who produce, sell and use seeds. It helps to gain information regarding planting value of seed lots, which need to be performed to obtain accurate and reproducible results regarding the quality status of the seed samples submitted to the seed testing laboratories, thereby enabling the farmer community to get quality seeds. Seed testing is conducted to achieve the following objectives:

- **Planting purposes:** To determine the quality of seed lots, i. e. their suitability for planting
- To identify the seed quality problems and their probable causes
- To determine the need for seed drying and processing and specific procedures to be used
- **Labeling purposes:** To determine whether a seed lot meets established quality standards or labeling specifications or not?
- **Upgrading the seed quality:** To determine the need for drying and processing and specific procedures that should be used
- Fixation of seed prices: To establish quality and provide a basis for price and consumer discrimination among lots in the market.

Hence, seed testing is considered to be an integral part of seed programme in India for the purpose of certification and seed law enforcement.

The importance of seed testing was realized more than 100 years ago for assured planting values, when the adulteration of vegetable seeds was practiced by mixing stone dust in some parts of the world, particularly in Europe, when Professor Friedrich Nobbe (Germany) in 1969 advocated that the seeds must be tested before sowing. In India, it was decided in the late fifties to establish at least one seed testing laboratory in each State/Union territory. The Seeds Act was passed in 1966 and Seed Analyst and Laboratories have been assigned important role to ensure the quality of planting material for sale. In fact, seed testing laboratory is considered as the hub of seed quality control. At present, about 140 Seed Testing Laboratories are functioning in the country and testing more than 6 lakh seed samples annually, including 2 Central Seed Testing Laboratories at National Seed Research and Training Centre, Varanasi and Central Institute for Cotton Research, Nagpur (for GM cotton only).

Seed is considered to be a legal entity in India subsequent to the promulgation of Seeds Act in 1966. Further, Seed Rules were framed in 1968 to implement various legislations given under Seed Act, 1966 for regulating the quality of certain seeds for sale, and for matters connected therewith, and ensure the availability of good quality seeds to the farmers. The main provisions deal with setting up of the seed laboratory, seed sampling, seed analysis and report/results. Thus, all essential aspects of the seed testing have been taken care of in the Seeds Act and Seeds Rules.

The major provisions in the Seed Act related to seed testing include:

- Seeds Act and Seeds Rules provide for quality certification and minimum quality standards of notified kind/varieties.

- The varieties are notified under the Seeds Act subsequent to official release, so that quality of seeds can be regulated.
- Notification of the variety is made by Central Government on the recommendation of the Central Seed Committee.
- The main purpose of notification is to bring the seeds of particular crop under the purview of Seed Law Enforcement.
- Quality Control as envisaged in the Act is to be achieved through pre & post marketing control, voluntary certification and compulsory labeling of notified kind/varieties
- Minimum limit for germination, physical and genetic purity of varieties have been prescribed and notified for labeling the seeds of notified kind varieties under Section 6 of the Seeds Act.
- All seed of notified varieties sold to farmers must meet the minimum standards of germination and physical purity.
- The seed should be packed in a suitable container and a label has to be affixed on the container.
- Information about germination, physical purity, variety, date of test, name of the seed producer has to be mentioned on the label.
- The validity period of certification tag is nine months from the date of test, which can be further extended for six months, provided seed conforms to the prescribed standards in respect of physical purity, germination and insect damage on retesting.
- The seed samples of the notified varieties are being sent to the Seed Testing Laboratory of the state for analysis of germination and purity.
- In case of any legal disputes, the reference sample is sent to Central Seed Testing Laboratory, whose results will be final.
- There is a provision to set up Central Seed Laboratory and State Seed Laboratory to discharge functions enshrined under Section 4 (1) and 4(2) of the Seeds Act.
- Seed Analysts are appointed through notification with prescribed qualification.
- State Government under Section 13 of the Seeds Act may appoint such person as he thinks fit having prescribed qualification through notification as Seed Inspector and defined the areas within which they shall exercise jurisdiction for enforcing the Seed Law.
- Seed Inspectors appointed under relevant provision have adequate power under Section 14 of the Seeds Act to draw the samples of notified kind/varieties of seeds from the source to assess the quality of seed sold in the market.
- Seed Inspectors can seize the stock of the seed, issue stop sale order for 30 days in case the seed under reference contravenes the Act and Rules.

**Seeds Testing Laboratory:** Seed Testing is a part of Seed Certification Programme, Seed Law Enforcement, enforcement of Seeds (Control) Order, seed production and marketing.

There is a provision to Set up a Central Seed Laboratory and States Seed Laboratory to discharge various functions enshrined under the Seeds Ad. The Section 2(2) and Section 2(15) define these laboratories as under:

2(2): "Central Seed Laboratory means the Central Seed Laboratory established or declared as such under sub-section (1) of Section 4;

2(15): " State Seed Laboratory", in relation to any state, means the State Seed Laboratory established or declared as such under sub-section (2) of Section 4 for that State.



Section 4(1) and 4(2) of the Seeds Act specify that Central Government and State Governments could set up the Central Seed Laboratory and State Seed Laboratory respectively. The Section 4(1) and 4(2) read as under:

4(1):The Central Government may, by notification in the Official Gazette, establish a Central Seed Laboratory or declare any Seed Laboratory as the Central Seed Laboratory to carry out the functions entrusted to the Central Seed Laboratory by or under this Act.

4(2): The State Government may, by notification in the Official Gazette, establish one or more State Seed Laboratories or declare any Seed Laboratory as a State Seed Laboratory where analysis of seeds of any notified kind or variety shall be carried out by Seed Analysts under this Act in the prescribed manner.

### Functions of the Seeds Laboratories

(a) Services to the certification agencies for certification and validation/revalidation of foundation and certified seeds – **Certification sample**

(b) Testing of service samples, **Service sample** is the sample submitted to STL by the farmers or purchaser of the seed to know the quality of seed. It may be any seed – breeder seed, foundation seed, certified seed, labelled seed or farm saved seed; and

(c) Testing of seed law enforcement sample. This is the seed sample submitted to notified seed testing laboratory by the Seed Inspector to assess the quality of seed sold in the market as per Seeds Act, 1966 and Seeds (Control) Order, 1983 – **official sample**

Central Seed Laboratory has been other important functions under the Seeds Act and Seeds Rules. The detail of the same is given as under:

**Analysis of the sample received from accused vendor or complainant.** As specified under Section 16(2), any accused vendor or complainant could request the Central Seed Laboratory through Court to Analyse the sample. The Section 16(2) reads as under:

16(2) : "After the institution of a prosecution under this Act, the accused vendor or the complainant may, on payment of the prescribed fee, make an application to the court for sending any of the samples mentioned in clause (a) or clause (c) of sub- section (2) of Section 15 to the Central Seed Laboratory for its report and on receipt of the application, the court shall first ascertain that the mark and the seal or fastening as provided in clause (b) of sub-section (1) of Section 15 are intact and may then dispatch the sample under its own seal to the Central Seed Laboratory which shall thereupon send its report to the court in the prescribed form within one month from the date of receipt of the sample, specifying the result of the analysis."

**Analysis of the service sample:** The Central Seed Laboratory could also analyze the service sample of which results to be used as information for seeding, selling or labeling purposes (Rule 2(i) of Seeds Rules, 1968).

Apart from above, the Central Seed Laboratory has been assigned to perform the following functions as indicated in Rule 5 of the Seeds Rules, 1968. In addition to the function entrusted to the Central Seed Laboratory by the Act, the Laboratory shall carry out the following functions, namely:

(a) initiate testing programmes in collaboration with the State Seed Laboratories designed to promote uniformity in test results between all seed laboratories in India;

(b) collect data continually on the quality of seeds found in the market and make this data available to the Committee; and

(c) carry out such other functions as may be assigned to it by the Central Government from time to time.



## Functions of the State Seed Laboratories

State Seed laboratories are meant to analyze the seed samples of any notified kind or variety in the prescribed manner. The State Seed Laboratory is expected to analyze the samples received from various sources for the following different purposes.

(i) Analysis of the samples received from Seed Certification Agencies set up under Section 8 of the Seeds Act.

(ii) Analysis of the service samples: Seed users and seed producers could get seed sample tested to obtain the result to be used as information for seeding, selling or labeling purpose.

(iii) Analysis of the samples received from Seed Inspector to determine the compliance of labelling requirements under Section 7 of the Seeds Act.

## Seed Analyst

As per Section 2(12) "Seed Analyst" means a seed analyst appointed under Section 12, which reads as under:

"The State Government may, by notification in the Official Gazette, appoint such persons as it thinks fit, having the prescribed qualifications, to be Seed Analysts and define the areas within which they shall exercise jurisdiction."

The Seed Analyst should possess certain minimum qualifications as prescribed in Rule 20 of the Seeds Rules, 1968. The same are reproduced below: Qualifications of Seed Analyst: A person shall not be qualified for appointment as Seed Analyst unless he –

- i. possesses a Master's or equivalent degree in Agriculture or Agronomy or Botany or Horticulture of a University recognized for this purpose by the Government and has had not less than one year's experience in seed technology; or
- ii. possesses a Bachelor's degree in Agriculture or Botany of a University recognized for this purpose by the Government and has had not less than three years' experience in seed technology.

**Duties of a Seed Analyst:** The duties of a Seed Analyst have been specified in the Rule 21 of the Seeds Rules, 1968 and are reproduced below:

- i. On receipt of a sample for analysis the Seed Analyst shall first ascertain that the mark and the seal or fastening as provided in clause (b) of sub-section (1) of section 15 are intact and shall note the condition of the seals thereon.
- ii. The Seed Analyst shall analyze the samples in accordance with the provisions of the Seeds Act and Rules
- iii. The Seed Analyst shall deliver a copy of the report (in Form VII) of the result of analysis to the persons specified in sub-section (i) of Section 16, as soon as may be, but not later than 30 days from the date of receipt of samples sent by the Seed Inspector under sub-section (2) of the section 15.
- iv. The Seed Analyst shall from time to time forward to the State Government the reports giving the result of analytical work done by him.

**Precautions to be followed by Seed Analyst at the time of receipt of samples for analysis:** Rules 29, 30 and 31 of the Seeds Rules specify the precautions to be taken at the time of dispatch of the samples to Seed Analyst. The Rules 29, 30 and 31 read as under:

- i. **Rule 29:Samples, how to be sent to the Seed Analyst-** The container of sample for analysis shall be sent to the Seed Analyst by registered post or by hand in a sealed packet enclosed together with a memorandum in Form V in an outer Cover addressed to the Seed Analyst.
- ii. **Rule 30:Memorandum and Impression of seal to be sent separately -** A copy of the memorandum and a specimen impression of the seal used to seal the packet shall be sent to the Seed Analyst separately by registered post or delivered to him or to any person authorized by him.
- iii. **Rule 31:Addition of preservatives to Samples -** Any person taking a sample of said for the purpose of analysis under the Act may add a preservative as may be specified from time to time to the sample for the purpose of maintaining it in a condition suitable for analysis.
- iv. Accordingly, the Seed Analysts should ensure that seed sample is received in proper form.
- v. **Analysis of the Sample:** Rule 33 specifies the following:
- vi. "On receipt of the packet, it shall be opened either by The Seed Analyst or by an officer authorised in writing in that behalf by the Seed Analyst, who shall record the condition of the seal on the packet. Analysis of the sample shall be carried out at the State Seed Laboratory in accordance with the procedure laid down by the Central Government".
- vii. **Form of Report:** Rule 35 specifies that the report of the results of the analysis under sub-section (1) or sub-section (2) of Section 16 shall be delivered or sent in Form VII. A specimen copy of the same is given as under:

#### FORM VII

(Certificate of test and/or analysis by the Seed Analyst)

Certified that the sample(s) bearing  
number.....  
received on .....Memorandum  
No. ....  
Dated.....  
from.....  
has/have been tested/analysed and that the  
result/results of such test(s)/analysis is/are as  
stated below:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2.The condition of the seals on the packet and the  
outer covering on receipt was as follows:

\_\_\_\_\_

\_\_\_\_\_

Seed  
Analyst  
Central  
Laboratory

Place.....  
Date.....

If opinion is required on any other matter suitable  
paragraph(s) may be added  
**Fees:** The Rule 36 specifies the following  
"The fees payable in respect of the report from the  
Central Seed Laboratory under sub-section (2) of  
section 16 shall be Rs. 10/- per sample of the seed  
analyzed ".

**Retaining of the Sample:** Rule 37 specifies the following

"The sample of any seed shall, under clause (c) of sub-section (2) of section 15, be retained under a cool, dry environment to eliminate the loss of viability and insect proof or rat proof container. The containers shall be dusted with suitable insecticides and the storage room fumigated to avoid infestation of samples by insects. The sample shall be packed in goal quality containers of uniform shape and size before storage".

**National Seed Research and Training Centre (NSRTC), Varanasi**

The Government of India, Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Krishi Bhawan, New Delhi initiated the National Seed Research and Training Centre (NSRTC), Varanasi during October, 2005. The prime objective of establishment of NSRTC was to have a separate National Seed Quality Control Laboratory, which serves as a Central Seed Testing Laboratory (CSTL) w.e.f. 1st April, 2007 by Gazette Notification No. REGD.NO. D.L-33004/99 dated: 8th March, 2007. National Seed Research and Training Centre (NSRTC) is the apex centre to maintain the uniformity in seed testing results and HRD at national level. It monitors the all-State Seed Testing Laboratories and try to overcome their difficulties. It makes efforts to provide expertise/guidance to seed entrepreneurs and other stakeholders involved in seed development programme and make them more potent. Through National Trainings, National Workshops and National Seed Congress, NSRTC is continuously disseminating the knowledge of new techniques of seed testing, role of quality seed etc. to the various seed development agencies and other stakeholders. Central Seed Testing Laboratory (CSTL) has been assigned to analyse the sample of complainants through Court. Seed testing in collaboration of state testing laboratories and testing of market samples are also important programmes of CSTL. Central Seed Testing Laboratory is a member laboratory of International Seed Testing Association (ISTA) and undergoing PT programme of ISTA for accreditation which will ensure Seed Industry in India globally competitive.

**Objectives:**

- Promote quality seed availability to meet the challenges of science-based Agriculture.
- Making of promising technologies reach the seed entrepreneurs and other stakeholders through innovative Trainings, Conferences & Symposia.
- Establishing uniformity in Seed production & Quality Control programmes at National level.
- Innovative curriculum planning and implementation to make Seed Science & Research more vibrant and responsible to match the vision and needs of present and future.
- Provide common platform to all agencies and organizations concerned with the seed science at National level.
- Transfer of modern technologies in Seed science through organizing various HRD activities.
- Co-ordination with other premier institutes of the country and globe.
- Contribute in systematic manner with integrated approach to ensure availability of high-quality seeds to user.
- Strengthening the "Seed Quality Testing Network" in the country
- Innovative curriculum planning and implementation to make Seed Science & Research more vibrant and responsible to match the vision and needs of present and future.

### Activities

- **5% Re-testing programme of seed samples:** Under the 5% Re-testing programme, CSTL is testing 5% samples from notified state seed testing laboratories across the country free of cost.
- **Court referred seed samples:** Under this programme, CSTL is testing seed samples received from the Hon'ble court. The seed testing fee of Rs. 10/- sample is required and may be paid through Bharat Kosh Portal and the payment receipt should be sent to the Director, NSRTC through post.
- Participation in ISTA Proficiency Tests
- Conduct of Grow Out Test

**Seeds (Control) Order, 1983:** The Ministry of Civil Supplies through an order dated 24 February 1983 had declared the seed for sowing or planting of food crops, fruits, vegetables, cattle fodder and jute to be essential commodities in exercise of power conferred by Section 2(a)(viii) of Essential Commodities Act, 1955. It was followed by the issue of Seeds (Control) Order dated 30.12.1983 by the Ministry of Agriculture, Department of Agriculture and Co-operation in exercise of powers contained in Section 3 of Essential Commodities Act. The inclusion of seeds as an essential commodity under the Essential Commodity Act, 1955 and GoI declared all the crop seeds whether notified or not as an essential commodity under the Seeds (Control) Order 1983.

The order confers power to the Central Govt. to control, and regulate production, supply and distribution of essential commodities. Seeds (Control) Order, 1983 has been notified as per the Gazette Notification; G.S.R. 832 (E) dated 30.12.1983. The notification under reference holds good and remains operative. Joint Secretary (Seeds), Department of Agriculture & Cooperation, Ministry of Agriculture & Farmers Welfare, Govt. of India acts as the Controller of Seeds for the implementation of Seeds (Control) Order. Seeds (Control) Order, 1983 empowered the State Governments / Union Territories to either compulsorily license all the seed dealers within their jurisdiction or exempt such class of seed dealers deemed fit to it through official Gazette Notification. Whereas, the Seeds Act, 1966 (54 of 1966) provides for regulating the quality of certain seeds for sale, and for matter connected therewith; Seeds (Control) Order, 1983 regulates the trading activity in seeds. The important provisions of this order are:

- i. A person carrying on the business of selling, exporting and importing of seeds needs to obtain a license & notify the authority for grant of License. No person can sell, export or import seeds unless he possesses the license to do so or exempted from doing so through official Gazette notification.
- ii. The Essential Commodity Act, 1955 gives powers to State governments to regulate various aspects of trading in essential commodities under the supervision of Central Government. The act again passed with amendments in the year 1980 clearly states that detaining of persons whose activities are unethical in the supply of essential commodities. It is one of the legal instruments being enforced to check the supply of inferior seeds of notified and unnotified seeds to the farmers.
- iii. All persons carrying on the business of selling, exporting and importing seeds will be required to have a License to carry on the business in accordance with terms and conditions of License granted to him.
- iv. The license provided to a seed dealer remains valid only for 3 years from the date of its issue, which can be later renewed.
- v. Based on such enquiry as it thinks fit the licensing authority may grant or refuse the license in provisions of the Order.

- vi. Licensing Authorities are empowered to cancel or suspend the License under the relevant provision of the order.
- vii. It is mandatory for the licensed seed dealer to display stock position (opening and closing) of different seeds held by them and the price list on daily basis, maintenance of records, submission of returns to the Notified Authority, and faithfully abide the directives of Controller of Seeds to Govt. of India regarding distribution of seeds, if any.
- viii. A cash or credit sale memorandum need to be issued by the dealer to purchaser of seeds, compulsorily.
- ix. The State Government is empowered with appointing a licensing authority, inspectors and mode of action for supply regulation.
- x. Seed Inspectors notified under clause 12 of the Order are eligible to draw any samples of seeds meant for sale or export/import etc. and to ensure that the sample confirms to the standards of quality claimed by the Seed Dealer under clause 13 (c) of the order.
- xi. Seed Inspectors have powers for search and seize the seeds under relevant provisions of this order.
- xii. Under this order, the time period for completion of seed analysis in case of any doubt about quality is 60 days compared to 30 days under Seed Rules
- xiii. Provision for appeal and an appellate has also been provided.

## Annexure I

### **Amendments in Seed Act, 1966; Seed Rules, 1968 and Seed Control Order, 1983**

#### **Seeds (Amendment) Act, 1972**

**Amendment of Section 2 of 1966** - In section 2 of the Seeds Act; 1966 (hereinafter referred to as the principal Act), in clause (11), after sub-clause (iii), the following sub-clause shall be inserted, namely: - "(iv) jute seeds,".

#### **Insertion of new sections 8A to 8E**

**Amendment of section 9** - In section 9 of the principal Act,- (i) in sub-section (3), for the words, brackets, letter and figure "minimum limits of germination and purity specified for that seed under clause (a) of section 6", the words "prescribed standards" shall be substituted; (ii) to sub-section (3), the following provision shall be added, namely:- I "Provided that such standards shall not be lower than the minimum limits of germination and purity specified for that seed under clause (a) of section 6."

**Amendment of section 25** - In section 25 of the principal Act, -

(a) in sub-section (2), after clause (f), the following clause shall be inserted, namely: - "(ff) the standards to which seeds should conform,";

(b) in sub-section (3), for the words "in two successive sessions, and if, before the expiry of the session in which it is so laid or the session immediately following", the words "in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid" shall be substituted

#### **Seeds (Amendment) Rules, 1973**

In rule 21 of the said rules for sub-rules (2) and (3) the following sub-rules shall be substituted, namely:

"(2) The Seed Analyst shall analyze the samples in accordance with the procedures laid down in the Seed Testing Manual published by the Indian Council of Agricultural Research as amended from time to time."

"(3) The Seed Analyst shall deliver in Form VII, a copy of the report of the result of analysis to the persons specified in sub-section (1) of Section 16, as soon as may be but not later than 30 days from the date of receipt of samples sent by the Seed Inspector under sub-section (2) of the Section 15". 4.

In Rule 23 of the said rules, in clause (h) for the words competent authority "the words" State Government shall be substituted.

#### **Seeds (Amendment) Rules, 1974**

After rule 23 of the said rules, the following rule shall be inserted namely: -

"23-A. Action to be taken by the Seed Inspector if a complaint is lodged with him: -

(1) If farmer has lodged a complaint in writing that the failure of the crop is due to the defective quality of seeds of any notified kind or variety supplied to him, the Seed Inspector shall take in his possession the marks or labels, the seed containers and a sample of unused seeds to the extent possible from the complaint for establishing the source of supply of seeds and shall investigate the causes of the failure of his crop by sending samples of the lot to the Seed Analyst for detailed analysis at the State Seed Testing Laboratory. He shall thereupon submit the report of his findings as soon as possible to the competent authority.

(2) In case, the Seed Inspector comes to the conclusion that the failure of the crop is due to the quality of seeds supplied to the farmer being less than the minimum standards notified by the Central Government, launch proceedings against the supplier for contravention of the provisions of the Act or these Rules."

#### **Seeds (Amendment) Rules, 1981**

After rule 17 of the Seeds Rules, 1968, the following rule shall be inserted, namely: -

"17-A. The Certification agency shall, before granting the certificate, ensure that the seed conforms to the standards laid down in the Manual known as "Indian Minimum Seed Certification Standards" published by the Central Seed Committee, as amended from time to time."

#### **Seeds (Control) Amendment Order, 2006**

In the Seeds (Control) Order, 1983, after clause 8, the following clause shall be inserted, namely:-

"8A. Dealers to ensure certain standards in respect of seeds: Every dealer of seeds in notified kind or variety or other than notified kind or variety of seeds shall ensure that the standards of quality of seeds claimed by him shall conform to the standards prescribed for the notified kind or variety of seeds under Section 6 of the Seeds Act, 1966 (54 of 1966) and any other additional standards relating to size, colour and content of the label as may be specified.

#### **Seeds (Control) Amendment Order, 2014**

In the Seeds (Control) Order, 1983, -

(a) in paragraph 4, relating to 'Application for license', for the words "a fee of rupees fifty", the words "a fee of rupees one thousand" shall be substituted;

(b) in paragraph 7, relating to 'Renewal of license',-

(i) in sub-paragraph (1), for the words "a fee of rupees twenty", the words "a fee of rupees five hundred" shall be substituted;

(ii) in sub-paragraph (2), for the words "additional fee of rupees twenty-five", the words "additional fee of rupees five hundred" shall be substituted.

#### **Seeds (Amendment) Rules, 2014**

In the Seed Rules, 1968, for "Form I to VIII" the following forms shall be substituted, namely: -

FORM I (See rule 15): Application for grant of certificate by seed certification agency

FORM II (See rule 17) - Certificate

FORM III (See rule 27) - Details of stock of seeds contravening the provisions of section 6 of the Seeds Act, 1966.

FORM IV (See rule 28) - Form of receipt for seizure of records

FORM V (See rule 29) - Memorandum to Seed Analyst

FORM VI (See rule 34) - Notice for drawing samples

FORM VII (See rule 35) - Certificate of test and/or analysis by the Seed Analyst

#### **Cotton Seed Price (Control) Order, 2015**

The Central Government, after consultation with the Committee referred to in sub-clause (2) of the said clause to recommend the maximum sale price of cotton seed, hereby declares the maximum sale price of Bt. cotton seed packets (450 grams of Bt. cotton seed plus 120 grams refugia) specified in the Table below for the financial year 2017-18 for the whole of India.

S. No.	Components (in rupees)	BG-I version of Bt.cotton hybrid	BG-II version of Bt.cotton hybrid
1.	Seed value	635	751
2.	Trait value incl. taxes	0	49
	<b>Maximum sale price</b>	<b>635</b>	<b>800</b>

#### **Seeds (Control) Amendment Order, 2019**

In the Seeds (Control) Order, 1983, in clause 6, relating to 'period of validity of License', for the words "three years", the words "five years" shall be substituted.

#### **References:**

- Agrawal P.K. (1993). Handbook of Seed Testing, Dept. of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India, New Delhi, pp: 340.
- <https://eparlib.nic.in/bitstream/123456789/516141/1/16888.pdf>

- Santhy V. and VijayaKumari, P.R.. Legislations for Seed Quality Regulation. **In:** CICR Technical Bulletin No: 38, Central Institute for Cotton Research Nagpur (India).
- <https://seednet.gov.in/>

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## The Seeds (Control) Order, 1983 – An Over View

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The Ministry of Civil Supplies, Govt. of India, New Delhi through an order S. O. 140 (E) dated 24<sup>th</sup> February, 1983 had declared the seed for sowing or planting of food crops, seeds of fruits and vegetables, seeds of cattle fodder and Jute to be essential commodities in exercise of power conferred by section 2 (a) (xi) of the Essential Commodities Act, 1955. Further, Ministry of Consumer Affairs, Food and Public Distribution, Govt. India, New Delhi vide Notification S.O. 3267 (E) dated 22<sup>nd</sup> December, 2009 and S.O. 2988 dated 22<sup>nd</sup> December, 2010 added Cotton seed as an essential commodity.

The Ministry of Agriculture, Govt. of India, New Delhi issued the Seeds (Control) Order, GSR 932 (E) dated the 30<sup>th</sup> December, 1983 in exercise of powers conferred by section 3 of the Essential Commodities Act, 1955 which deals with central government's power to control production, supply and distribution of essential commodities.

A number of Seed Dealers Association and Bodies had challenged the Order dated 24<sup>th</sup> February, 1983 in the High Court of Delhi, Jaipur and Madras on the ground that seeds of the above mentioned categories do not constitute essential commodities. The cases there after were transferred in 1986 to the Supreme Court of India. The Supreme Court in its order dated 20<sup>th</sup> October, 1993 uphold the validity of the order. The details of the same are as follows.

The basic question involved in these matters is the validity of the notification Order dated 24<sup>th</sup> February, 1983 where by inter-alia seeds of food crops and seeds of fruits and vegetables have been declared as essential commodities for the purpose of the Act. The validity of the notified Order inter-alia is challenged on the ground that the seeds of food crops and seeds of vegetables are not of class of commodities which could be declared by Central Government as essential commodities for the purposes of the Act. The argument was that is as because such a commodity is not a commodity in respect on which the Parliament has powers to make law by virtue of entry 33 of List III of the VII schedule to the constitution of India reads as follows.

"33. The trade and commerce in and the production, supply and distribution of:

- (a) the products of any industry where the control of such industry by the Union is declared by Parliament by law to be expedient in the in the public interest, and imported goods of the same kind as such products;
- (b) food stuffs, including oilseeds and oil;
- (c) cattle fodder, including oilcakes and other concentrates;
- (d) raw cotton, whether ginned or un-ginned, and cotton seeds; and
- (e) raw jutes.

It is clear that the afore said entry 33 deals with not merely trade and commerce in but in the production, supply and distribution of various products and articles mentioned in clause (a) to (e) thereof. Clause (b) of Entry 33 mentions food stuffs as a class of commodity which includes edible oilseeds and oil.

food stuffs but also in relation thereof in production, supply and distribution as well. Once it is clear that Entry 33 also deals production, it is obvious that seeds are a vital commodity having direct connection with production of the food stuffs to which it relates. Therefore, seed of food stuffs are an item which has direct bearing with production of the food stuffs and consequently it is competent for the Parliament as well as a State to make laws in relation to seeds of food stuffs. Surely, seeds of food crops and seeds of fruits and vegetables related to food stuff.

After consideration of all relevant aspects, it was decided that the order be implemented by State Government with effect from 1<sup>st</sup> July, 1994. The Seeds (Control) Order, 1983 which had been notified as per Gazette Notification GSR 932 (E) dated 30<sup>th</sup> December, 1983 hold good and remain operative.

The Joint Secretary (Seeds), Ministry of Agriculture, Government of India, New Delhi has been appointed as the Seed Controller vide Gazette Notification S.O. 480 (E) dated 29<sup>th</sup> June, 1994 for implementation of the Seeds (Control) Order, 1983.

The Seeds (Control) Order, 1983 has two major components such as (1) Dealers in Seeds to be Licensed and (2) Enforcement Authority.

No person shall carry on the business of selling, exporting or importing seeds without a License. The appointment of Licensing Authority and the Seed Inspectors with their jurisdiction areas by the State Government is the mechanism of seed law enforcement.

Every person desiring to obtain a License for selling, exporting or importing seeds shall make an application in Form A to the Licensing Authority together with a fee prescribed for it.

The Licensing Authority may grant a License in Form B with the terms and conditions of the License.

The Licensing Authority may refuse to grant a License in Form B with the reasons for doing so.

The validity period of the Seed License shall be for three years from the date of issue.

The Seed License shall be renewed by the Licensing Authority before the expiry by making an application in Form C together with a fee prescribed for it.

Seed License shall be renewed Licensing Authority after the expiry but within one month from the date of expiry by making an application in Form C together with a fee prescribed for it and additional late fee.

The Seed License may be amended by the Licensing Authority if a written request is submitted to the Licensing Authority together with a prescribed fee.

The Seed License may be suspended or cancelled by the Licensing Authority due to mis-representation of fact while obtaining License and or contravention of any of provisions of the Seeds (Control) Order, 1983 or the terms and conditions of the License.

Any person aggrieved due to refusal to grant a License or amend a License or renew a License or suspension or cancellation any License, may appeal to the Appellate Authority within sixty days from the date of such order through an application together with the prescribed fee.

The seed dealers shall display the opening and closing stock on daily basis and the price list of different seeds at the place of business.

The seed dealers of notified kind or variety or other than notified kind or variety shall ensure that the standards of quality of seeds claimed by him shall conform to the standards prescribed for the notified kind or variety of seeds and any other additional standards relating to size, color and content of the label may be specified.

Every seed dealer shall give cash or credit memorandum to a purchaser of seeds. Every seed dealer shall maintain such books, accounts and records relating to his business as may be directed by the State Government. Every seed dealer shall submit monthly return relating to his business for the preceding month in Form D to the Licensing Authority by the 5<sup>th</sup> day of every month.

Every person, if so required by the Seed Inspector, shall be bound to offer all necessary facilities to him for the purpose of enabling him to exercise his power.

Every seed dealer shall give any information in his possession with respect to purchase, storage and sale of seeds by him to the Seed Inspector.

Every seed dealer shall allow the Seed Inspector to enter upon and search any premises where any seed is stored to ensure compliance with the provisions of the Seeds (Control) Order, 1983.

The Seed Inspector may draw samples of seeds meant for sale, export or seeds imported and send the samples to the specified Seed Testing Laboratory as per the prescribed procedure to ensure that the sample conforms to the standards of quality claimed.

The Seed Inspector may seize or detain any seed in respect of which he has reason to believe that a contravention of this Order has been committed or is being committed.

The Seed Inspector may seize any books of accounts or documents relating to any seed in respect of which he has reason to believe that a contravention of this Order has been committed or is being committed.

The Seed Inspector shall give a receipt in respect of the books of accounts or documents seized to the person from whom they have been seized.

The Seed Inspector may return the seized books of accounts or documents to the person from whom the same had been seized after copies thereof or extracts there from as certified by such person have been taken.

The Seed Inspector shall follow the provision of paragraph (d) of sub-clause (1) of section 100 of the Code of Criminal Procedure 1973 (2 of 1974) for search and seizure.

The Seed Inspector shall follow the provisions of sections 457 and 458 of the Code of Criminal Procedure, 1973 (2 of 1974) for reporting the fact of seizure to a Magistrate and for custody and disposal of the seized seed.

The analysis report of the sample sent by a Seed Inspector to a Seed Testing Laboratory for analysis shall be sent to the Seed Inspector within sixty days from the date of receipt of the sample in the laboratory.

The Controller of seeds by an order in writing may direct any producer or dealer to sell or distribute any seed in such manner as may be specified in the same order.

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# Determination of Seed Viability

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## Seed Viability

"Seed viability can be defined as the ability of the embryo to live, grow and develop into a seedling under favorable environmental conditions".

Or

Seed viability refers to state of aliveness

## Objectives of seed viability

- To obtain quick estimation of viability of seed samples or of individual seeds remain ungerminated at the end of germination test.
- To determine the rapidly viability of the seeds of certain species which germinate very slowly or show high degree of dormancy.

## Factors affecting seed viability

### 1. Internal factors

- ✓ Immature and small seeds within a seeds ,within a seed lot do not store as well as mature and large seeds within a seed lot (Wien *et al*)
- ✓ Several kinds of environmental stresses during seed development, and prior to physiological maturity, can reduce the longevity of seeds.
- ✓ The physical condition and physiological state of seeds greatly influence their life span.
- ✓ Seeds that have been broken, cracked, or even bruised deteriorate more rapidly than undamaged seeds(McDonald 1985;Priestley 1986)

### 2. Genetic factor

Seeds of some species are genetically and chemically equipped for longer storability than others under similar conditions.

Most long-lived seeds belong to species possessing hard, impermeable seed coats. Seeds of canna (Sivoriet *et al.*, 1968), Lotus (Wester 1973), and Lupinus (Porsild and Harrington 1967) have been reported to be viable even after 500 years.

Seeds of other species are characteristically short lived; these include vegetables such as lettuce, onion, and parsnip and also agronomic crops such as Rye. Generally seed species possessing high oil content do not store as well as those with low oil content. For ex, whole wheat seeds contain only about 3% oil, but their embryo portion has about 27% oil. Seeds of different species may also be chemically similar but have different storability due to differences in genetic potential. For example, Chewings Fescue and annual rye grass seeds are similar in appearance and chemical composition; however rye grass seeds have much better storability under comparable conditions. Genetic differences in storage potential are not limited to seeds of different species, It also occur among cultivars. The bean cultivar black Valentine stores better than Brittle wax (Toole and Toole 1953). However the environment strongly alters the genetic potential for seed longevity.

## Relative humidity and temperature

### Temperature

At a temperature of 0° c, formation of intracellular ice crystals can disrupt membrane integrity & contribute to seed deterioration. However Seeds with moisture levels below 14%

do not form ice crystals. It should be noted, however, that at 14% initial moisture, seeds stored in cold rooms below 0°C will likely gain moisture. Most cold rooms have a high relative humidity & seeds achieve equilibrium with relative humidity after a brief period of storage. Thus seeds stored at low temperature must be in conditions in which the relative humidity is controlled or placed in moisture -proof containers to avoid increase in moisture content & increased deterioration.

### **Seed Moisture**

Seeds contain moisture above 14% begin to exhibit increased respiration, heating, and fungal invasion that destroy seed viability more rapidly. Below 5% seed moisture, a breakdown of membrane structure hastens seed deterioration. This probably a consequence of reorientation of hydrophilic cell membranes due to loss of the water molecules, necessary to retain their configuration. Thus, studies standardized that storage of seeds Cereal (10-12 %), Pulses (7-8 %), Vegetables (4-5 %), Oilseeds (7-8 %) appears to be ideal; for maximum longevity.

### **Viability tests**

- Standard Germination test
- Tetrazolium test
- Excised embryo test
- Fast green test
- Conductivity test

### **1. Standard germination test**

The emergence and development of seedling to a stage where the aspects of its essential structures indicate whether or not it is able to develop further in to a satisfactory plant under favorable conditions in soils (ISTA, 1985).

#### **Steps of germination test**

- Putting of seeds
- Keeping in germinators at optimum condition
- Period of test -Days to count -I<sup>st</sup> and II<sup>nd</sup> count
- Seedling evaluation
- Calculation of results
- Reporting of results

#### **Seedling evaluation:**

- CONCEPT: Evaluation should be done only after all essential structures are fully expressed & evaluate as NS, AS, HS, FUG & dead seeds
- Normal seedlings (NS) : Seedlings showing continued capacity for development into normal plant when grown in good quality soil under favorable conditions
- NS Categories (ISTA)
- Intact seedlings :Seedlings with essential structures well developed in all proportions, healthy, showing balanced growth
- Slight defective Seedlings : Seedlings with slight defects in their essentials structures provided they show normal vigorous, balanced growth in comparison with intact seedlings
- Seedlings with secondary infection: Seedlings with clear evidence of secondary infection are classified as NS provided all essential structure are otherwise normal.

- Seedlings with secondary infections even if seriously decayed or diseased are considered as normal

## 2. Tetrazolium test

Tz is a biochemical test and one of the quick methods to predict seed viability developed by Lakon (1942) in Germany.

**Viability:** Seed viability indicates that a seed contains structures and substances enzyme system which give it the capacity to germinate under favorable condition in the absence of dormancy.

### Objectives:

1. To obtain quick estimation of viability of seed samples or of individual seeds remained ungerminated at the end of germination test.
2. To determine the rapidly viability of the seeds of certain species which germinate very slowly or show high degree of dormancy.

### Equipments and chemicals required:

- a. One percent solution (W/V) of 2, 3, 5 Triphenyl tetrazolium chloride (TZ) or bromide.
- b. Potassium dihydrogen phosphate.
- c. Disodium hydrogen phosphate.

Conditioning Media: Blotter, paper towel or beaker.

Cutting or piercing devices: Razor blade, dissecting knives and needles.

Staining dishes: Watch glasses/petridishes.

Magnifying devices: Hand lens and stereoscopic microscope.

### Preparation of buffer solution

Solution 1 – dissolve 9.078 g  $\text{KH}_2\text{PO}_4$  in 1000 ml water

Solution 2 – dissolve 11.876 g  $\text{Na}_2\text{HPO}_4$  in 1000 ml water

Mix 400 ml of solution 1 with 600 ml of solution 2 to get a liter buffer solution of neutral pH.

To get 1% of TZ solution, dissolve 1 g of TZ salt in 100 ml of buffer solution. (The one percent solution is used for seeds that are not bisected through the embryo, while the 0.1 percent solution is used for seeds in which the embryo is bisected. Other low concentration such as 0.2 percent and 0.5 percent are some time used instead of 0.1 percent solution).

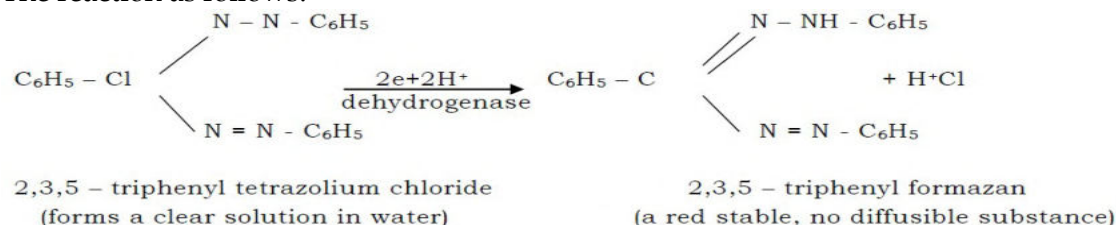
**Straining:** The prepared seed should be placed in suitable container (small beaker, Petri-dishes, watch glass, etc.) and place these container in a dark ward place. The staining time varies for different kinds of seed, different methods of preparation and different temperature (less than one hour to approximately eight hours).

A sample is satisfactorily stained when tissue develops interpretable staining characteristics and the analyst can sense 'embryo conditions. When observations indicate that a sample has stained sufficiently, the TZ solution should be discarded and observation can be made.

**Principle:** when the seeds are soaked in colorless solution of 2, 3, 5 triphenyl tetrazolium chloride (TZ) or bromide. it interferes with the reduction process of living cells within the seed tissue and accepts hydrogen ions from the dehydrogenase enzymes. Due to hydrogenation, ( $\text{H}^+$  ions transfer) triphenyl tetrazolium chloride get reduced into a red coloured compound, non diffusible substance called formazan. In the living cells. Since, the reactions takes place

within the respiring (living) cells and the formazan is no diffusible a clear topography of living and nonliving areas within the seed can be developed by using proper procedure. For this reason, the test is designated as the topographical tetrazolium test.

The reaction as follows:



**Evaluation of sample:** The sample is ready for evaluation when it is stained. Observe the staining pattern and calculate the percentage of viable seed.

### 1. On the basis of staining of embryo

- Embryo completely stained- viable.
- Embryo unstained-non viable.
- Plumule or radical unstained-non viable.

### 2. Assessment on the basis of cotyledon

- Complete staining-viable.
- Unstained-non viable.
- Necrosis -evolution on the basis of category.

### 3. Assessment on the basis of necrosis

- Unstained tissue at the attachment of the embryo-non viable.
- Unstained tissues are away and are not connected with embryo-viable.

### 4. Assessment on the basis of color intensity

- Dark red - vigours seed.
- Pink color -weak seed.
- Dark red fractured- non viable.

### 5. Specific evaluation

#### A. Germinable seeds of cereals

- Well developed embryo with an fractured normal cherry red stain.
- Necrosis with the upper or lower ends of the scutellum.
- Radical unstained but embryonic axis stained.

#### B. Non germinable seeds f cereals

- Whole embryo unstained.
- Scutellum node unstained.
- Major area of coleoptiles unstained.

#### C. Germinable seeds of legumes/oil seeds

- Non fractured red colored embryo and cotyledon.
- Normal red colored embryo with only one normal cotyledon.
- Normal red colored embryo with half or more than half of both the cotyledons attached to embryo are of red color.



#### **D. Non germinable seeds of legumes**

- a. Embryo completely unstained.
- b. Fracture at radical or plumule with dark red line.
- c. Plumule or radical tip unstained.
- d. More than ½ part of both the cotyledons attached to embryo are colorless.
- e. Attachment of embryo to cotyledon is unstained.

**Calculation:** the results are reported as percentage of viable seeds in relation to total seed tested.

#### **Advantages of TZ:**

1. Quick estimate of viability can be obtained (within 12-20 hrs.)
2. When the seed is dormant or very slow in germination, a viability test is extremely useful.
3. Seeds are not damaged (in dicot only) in analysis, therefore they could be germinated.

#### **Disadvantages of TZ:**

1. It is difficult to distinguish between normal and abnormal seedlings.
2. It does not differentiate between dormant and non dormant seeds.

#### **3. Excised embryo test**

- The excised embryo test is similar to germination tests in that it measures the quality of the seed by their actual germination.
- In addition it allows some measure of the embryo dormancy to be made, by counting those seeds which, although not growing normally, have grown slightly, remained firm and have kept their colour for the test period.
- The test is not valid for previously germinated seeds and must not be applied to samples which contain any dry germinated seeds.
- The success of the test requires considerable skill and experience in the operator and the ISTA rules restrict it to only a few species

#### **4. Fast green test**

- The fast green test reveals physical fractures in the seeds such as corn.
- Seeds are soaked in a 0.1% fast green solution for only 15-30 seconds.
- During this period, the fast green penetrates any area of the seed coat which has been fractured and stains the endosperm green .
- After the soak period, the seeds are washed and the fractures then become apparent (visible) in the seed coat.

#### **5. Conductivity test**

- The conductivity test is a biochemical test, which measures the amount of electrolytes, which leach through the seed coat or fruit coat of the intact seed.
- A higher conductivity may indicate a low viable seed lot.
- The expected readings for a conductivity test will vary greatly from crop to crop.
- It is most useful for peas, soybean samples, and a lesser degree for corn.

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# Intellectual Property Rights in Agriculture: Patenting Seeds and Plants

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If a plant or seed is defined by a single DNA sequence developed by research, it has chances of being patented in many countries. Whereas India has granted numerous process patents on plants that have undergone genetic modification. But patents for plants per se is not possible in India. In India, the Department-Related Parliamentary Standing Committee on IPRs recommended in a 2021 report on IP rights that the government revisit the possibilities for patenting plants and seeds which are otherwise barred under section 3 (j) of the Patent Act, 1970 as amended in 2005. The committee recommended that "a thorough analysis should be conducted by the Department on approving the patents on plants and seeds favorable to the agriculture sector of the country with a pre-condition of making Government of India as a participant in the patent. It recommends the Department to hold proper discussions and wide consultations with farmers groups/associations and necessary stakeholders to examine the plausibility of allowing the patents on plants and seeds that yields benefits to the farmers of the country. This clearly points towards seeking approval of patent on plants and seeds in India.

## Plant patents in India

There was great opposition to the granting of patents to plants, their parts and seeds, to protect farmers in India from any kind of restriction on their right to save seeds for growing in the next season.

A corollary section 3(J) as introduced in May 2003 clearly put a bar on patenting *inter alia* "plants in whole or any part thereof but including seeds, varieties and species and essentially biological processes for production or propagation of plants". Consequently, plant cells, lines and tissues are also not patentable. Additionally, methods and processes of horticulture and agriculture continued to remain non-patentable under section 3(h). However, genetically modified plants were made patentable under the patent law to meet the requirement of the TRIPS agreement.

In 2001, India opted for a *sui generis* system to provide protection for plant varieties with a safeguard to protect farmers' rights under the Plant Variety Protection and Farmers' Rights Act (2001).

## New paradigm on plant patents

It is possible to obtain patents on plants and seeds that benefit farmers if they are defined by a single DNA sequence that has been created by any one person. Many patents on genetically modified plants and seeds have been granted in India.

However, new plants or seeds that have improved through natural selection and been merely discovered are not qualified as patentable for the simple reason that farmers are free to save the best seeds and plants to ensure optimum future yields.

Plants discovered in an uncultivated state and asexually developed plants are also not eligible for patent protection.

This opens the possibility for adopting a new *sue generis* act in India in line with US plant laws but with proper safeguards by securing the rights of the farmers to re-grow and sell the saved improved seeds obtained through natural selection.

Protection of Plant Varieties & Farmers' Right

In order to fulfill obligations under TRIPS Agreement, India has implemented the Protection of Plant Varieties and farmers Right Act 2001.

### Objectives of the PPV & FR Act, 2001

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1. To establish an effective system for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants.
2. To recognize and protect the rights of farmers in respect of their contributions made at any time in conserving, improving and making available plant genetic resources for the development of new plant varieties.
3. To accelerate agricultural development in the country, protect plant breeders' rights; stimulate investment for research and development both in public & private sector for the development new of plant varieties.
4. Facilitate the growth of seed industry in the country which will ensure the availability of high quality seeds and planting material to the farmers.

### Rights under the Act

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1. **Breeders' Rights** : Breeders will have exclusive rights to produce, sell, market, distribute, import or export the protected variety. Breeder can appoint agent/ licensee and may exercise for civil remedy in case of infringement of rights.
2. **Researchers' Rights** : Researcher can use any of the registered variety under the Act for conducting experiment or research. This includes the use of a variety as an initial source of variety for the purpose of developing another variety but repeated use needs prior permission of the registered breeder.
3. **Farmers' Rights**
  1. A farmer who has evolved or developed a new variety is entitled for registration and protection in like manner as a breeder of a variety;
  2. Farmers variety can also be registered as an extant variety;
  3. A farmer can save, use, sow, re-sow, exchange, share or sell his farm produce including seed of a variety protected under the PPV&FR Act, 2001 in the same manner as he was entitled before the coming into force of this Act provided farmer shall not be entitled to sell branded seed of a variety protected under the PPV&FR Act, 2001;
  4. Farmers are eligible for recognition and rewards for the conservation of Plant Genetic Resources of land races and wild relatives of economic plants;
  5. There is also a provision for compensation to the farmers for non-performance of variety under Section 39 (2) of the Act, 2001 and
  6. Farmer shall not be liable to pay any fee in any proceeding before the Authority or Registrar or the Tribunal or the High Court under the Act.

### Registration of varieties

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A variety is eligible for registration under the Act if it essentially fulfils the criteria of Distinctiveness, Uniformity and Stability (DUS). The Central Government issues notification in official Gazettes specifying the genera and species for the purpose of registration of varieties. So far, the Central Government has notified about 157 crop species for the purpose of registration. There are four types of varieties which can be protected under the law:

1. Extant variety

2. Essentially derived variety
3. Transgeneic variety
4. Farmers' variety

### **Conclusion**

Normally, patents are denied to plants based on objections that new plants resulting from the product of nature are merely fruits of our natural world. The patenting of products of nature is denied in all jurisdictions. Another objection to plant patents is that mere discoveries should be excluded as patentable subject matter. However, human intervention criteria may be useful to seek patents for plants. This recommendation of the parliamentary committee seeks to remove this bar on the patent protection and make newly discovered plants including cultivated mutants, hybrids, and seedlings in cultivated areas eligible for patent protection as well. However, this is certainly a welcome move to promote and protect plant and seed patents. It will help promote the innovation of farmers and plant nursery skilled workers in India as well.

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