CHAPTER-IV
AGRICULTURAL SEEDS: QUALITY MANAGEMENT
REGULATIONS IN INDIA AND PRODUCTION OF CERTIFIED
SEEDS IN NAGAPATTINAM DISTRICT

4.1 INTRODUCTION

The seed is an important agricultural input and it plays a vital role in increasing production and productivity. There is a need to safeguard the farmers with the supply of genetically pure and quality seeds. Any new variety produced by the Scientists has to be multiplied many times to meet the needs of the farmers. In order to ensure the availability of quality seeds, the Government of India has enacted Seeds act, 1966 and Seed rules, 1968. The seed (Control) order, 1983 was promulgated under Essential commodities Act, 1955 in order to ensure the production, marketing and equal distribution of the seeds.

Seed marketing should aim to satisfy the farmer's demand for reliable supply of a range of improved seed varieties of assured quality at an acceptable price. However, the difficulties of organizing effective seed delivery systems, especially to small-scale farmers, have often been underestimated in comparison with the attention given to other seed industry activities. Historically, more attention and resources have been devoted to the physical aspects of seed production and storage than to the difficult organizational issues involved in managing sales and distribution.

4.2 Seed Legislations by Government of India

Development of improved crop varieties is vital for sustained increase in agriculture production and productivity. Timely supply of quality seed is equally significant since the contribution of quality seed alone is estimated to be 15- 20 per cent to total crop production (MSPAnnual Report 2006-07). India with a population of more than 1 billion and an arable area of 168 million hectares has one of the largest potential seed market in the world. The total Indian seed market valued around $500 million 10 years back (Gadwal, 2003), but it values $ 1 billion presently with large portion of seed trade involving local exchanges of established varieties or farmer bred seeds. The total amount of certified seeds produced is only 8 per cent (Gadwal, 2003) of total seed sown
each year. Therefore it is imperative to increase the production and distribution of quality seeds. Seed quality attains more significance in view of emerging biotic and a biotic stresses, issues related to quality and phyto-sanitary measures, competition in domestic and international markets and emerging food needs.

Measures of seed legislation with respect to quantity and quality were initiated in the country by establishment of National Seed Corporation during 1963 under Ministry of Agriculture. The seed sector in India during the period was dominated by the Public sector. The NSC was the Central Body to produce seeds of superior dwarf varieties in rice, wheat and, superior hybrids in maize, pearl millet and sorghum. This was followed by various seed legislations enacted by Government of India details of which have been enumerated in the followed pages. Further, AICRP-National Seed Project during 1979 (NSP) was undertaken by the Indian Government. The project resulted in achieving breeder seed production surpassing the indents in all major crops. Recently, Governments’ decision to embrace biotechnology as a means of achieving food security has made seed quality an important aspect in R & D and business sector in India such as “approval for commercial cultivation of Bt cotton” in the year 2002. Several leading multinational seed companies have entered the seed market and at present the composition of the seed industry by volume of turnover, has reportedly reached a ratio of 60:40 between the private and public sectors.

Since most of the farming community is illiterate or semi-literate, it is the responsibility of the Government to frame rules that govern the production and distribution of quality seeds to the farming community. Though seed act had been implemented in European countries at the far end of eighteenth century, India did have an act to designate seed quality parameters. This void was fulfilled during 1966, when the Seed Act was formed and followed by Seed Rules in 1968. Both were adopted during 1969 for the whole of India except Sikkim and Kashmir. Amendments were made subsequently for the Seeds Act during the years 1972, 1973, 1974 and 1981. With newer varieties coming into the agricultural scenario, the seeds control order was formed insisting on
compulsory licensing of the dealer. This was made even more stringent by bringing the seeds under the Essential Commodity Act, 1955. To help Multinational Corporations in utilizing the manpower and knowledge base of our country, the Plants, Varieties and Fruits Order was passed during 1989 and amended subsequently during 1998, 2000 and 2001. Finally the order was revised by another order, Plant Quarantine (Regulation of import into India) Order in 2003. Signing of WTO in 1995 paved the way for private research and development of varieties. In order to regulate such varieties, the protection of Plant Varieties and Farmers’ Right Act was passed in 2001 which was followed by National Seed Policy, 2002 and Seeds Bill, 2004.

4.2 SEEDS ACT (1966)

The object 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 passed by the Indian Parliament in 1966 was designed to create a 'Climate' in which the seeds the man could operate effectively and to make good quality seed available to cultivators. The major legislative measures involved under the Act are Seeds rules framed in 1968, Seeds (Control) order, formulated in 1983 after including seeds as an essential commodity A total of twenty five clauses have been mentioned in the act and they are:

- Enacted by Parliament for the whole of India to regulate seeds.
- Seeds of food crops, oil crops, cotton seeds, seeds of cattle fodder and all types of vegetative propagating material are included.
- Constitution of a Central Seed Committee (comprising eight members) 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.
- Establishing a Central Seed Laboratory as well as State Seed Laboratory to carry out seed analysis of notified variety.
- Empowerment of the Central Seed Committee to notify any variety found suitable as per the Act after notification in the Official Gazette.
• 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.
• Regulation of sale of seeds of notified varieties by compulsory truthful labeling revealing the true identity of the variety, germination as well as purity.
• Constituting a certification agency for undertaking the process of certification.
• 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.
• Empowerment to the agency for revocation of certificate if the agency is convinced that holder has obtained certificate by misrepresentation or not complied with the conditions.
• Provision for an appeal by the holder on payment basis to express before an appellate authority, his limitations for not complying with the conditions.
• Appointment of a seed analyst to undertake seed testing.
• 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).
• 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.
• Laying-out of procedure for seed sample collection and other rules. The clause 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.
• 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.

- 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 truly.
- Recognition of seed certification agencies of foreign countries for the purpose of this act.
- 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.
- Forfeiture of property (seeds) belonging to any person convicted under this act due to contravention of the procedures under this act.
- Punishment for offences committed by companies or anybody 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.
- Protection of Government action taken in good faith that is no prosecution or legal proceeding will lie against Government or any Government Officer for anything that is done in good faith.
- Power for Government to give directions for smooth conduct of the act
- Non-application of the act to the seed exchange by the farmers without any brand name.
- Power of Government to make rules to carry out various functions of Central Seed Committee, Central Seed Laboratory, Certification Agency and Seed Inspectors.
4.3. SEED RULES - 1968

The rules have been framed to implement various legislations given under Seed Act, 1966 and contain 11 sections.

4.3.1. Preliminary

This section provides definitions of various terminology used under the seed rule.

4.3.1.1 Central Seed 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 travelling and daily allowances payable to the members of the committee.

4.3.1.2 Marketing or Labelling

Rules for marking or labelling 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 labelled.

4.3.1.3 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.

4.3.1.4 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 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 colour 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.

### 4.3.1.5 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.

### 4.3.1.6 Seed Analyst and Seed Inspectors

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.
4. AMENDMENTS TO THE SEED ACT / SEED RULES

4.4.1 The Seeds (amendment) Rules, 1972

Inclusion of "jute seeds" to the Seeds Act, Establishment of a Seed Certification Board, and empowerment of the Board to fix minimum standards

4.4.2 The Seeds (amendment) Rules, 1973

Powers of appellate authority and duty of seed analyst have been slightly modified. Seed Testing Manual published by ICAR has been mentioned to be referred by the seed analysts.

4.4.3 The Seeds (amendment) Rules, 1974

More powers conferred on seed inspector during crop failure

4.4.4 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.

4.4.5 Seeds (Control) Order, 1983

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.

4.4.6 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.
- 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 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.

4.5 SEED ACT (2004)

The Seed Bill is replaced the Seed Act, 1966

- Compulsory registration of seeds that are to be offered for sale through test for Value for Cultivation and Use (VCU).
- Seed certification will continue to be voluntary.
- VCU will be tested by multi-location trials over three seasons. Samples of materials for registration will also be sent to NBPGR for retention in the National Gene Bank.
- Enable provisional registration based on the information filed by the applicant relating to dials over one season to tide over the stipulation of testing over three seasons before the grant of registration. The provisional registration will be for a period not exceeding two years.
- Accreditation of any organization or individual or any seed producing organization to carry out self-certification subject to the control of the seed committee and State Government.
- Registration of seed processing units will be required.
- Varieties already in the market at the onset of policy implementation will have to be registered within a fixed time period.
- Compulsory disclosure on the expected performance of a variety sold to a farmer. During failure the farmer may claim compensation under the Consumer Protection Act, 1986.
- All registered seeds should meet the minimum limits of germination, purity and seed health and the seed lots on sale should be compulsorily labeled. In transgenic varieties, the label should carry the name of transgender.
Compulsory registration of seed producer or any seed production organization, horticultural nurseries engaged in business.

Any registered varieties offered for sale can also be certified by the State Certification Agency if the dealer intents to A Central Seed Committee in line with National Seed Board provided in the Seed Policy, 2002 will be the apex body to fix or set the minimum standards for the seeds and decide which seeds are harmful or dangerous to the environment and public health.

Empowerment of Central Government to declare any Seed testing laboratory as the Central Seed Testing, laboratories which will also serve as referral lab in case of disputes. Empowerment of State Government in establishing one or more State Seed testing Laboratories.

Seed testing labs will be established in conformity with ISTA to meet the quality requirements of seeds during export.

Special provision for registration of transgenic provided the applicant has obtained clearance from GEAC.

The seeds imported can be subject to registration granted based on the results of multi location trials.

The import of transgenic seeds to be done only through NBPGR after approval from GEAC as per the EPA, 1986.

During import to the country all seeds are required to be accompanied by a certificate from competent authority regarding the it transgenic character

Compulsory testing of transgenic crop varieties under AICCIP to determine their agronomic value in co-ordinance with the tests for environment and bio-safety clearance as per the EPA before its commercial release.

Post release monitoring of transgenic for performance for 3 - 5 years by the Ministry of Agriculture and State Departments of Agriculture.

Provision of protection of transgenic as per PPV & FR provisions.

Appointing Seed inspectors with more powers unlike that mentioned in Seed Act, 1966. No warrant or procedural safeguards shall be applicable
Plant quarantine procedure need to be strictly followed during import of seed material with a permit from Plant Protection Adviser to the G.O.I.

Creation of data base on availability of seeds of different crops to assess the impact of exports on domestic availability of seeds.

Strengthening of testing and certification facility with international standards.

Encouraging seed production in non-traditional areas and subsidy to take up seed production in marginal lands.

Revocation of certificate under misrepresentation.

Recognition of Seed Certification Agencies in foreign countries.

Provision of appeals and establishment of an appellate authority.

A public opinion has emerged on the fact that Seed Bill provisions are contradictory to the PPV & FR legislations and that the Seed Bill has been drafted to suppress the merits of PPV & FR Act, 2001.

4.6 SEED CERTIFICATION DEPARTMENT

This department is carrying out the following activities in order to make available scientifically multiplied quality seeds to the farming community so as to improve the crop production and to sustain quality seed programme, through department and private efforts like, Seed Certification, Seed Testing and Training.

4.6.1 Seed Certification

This department carries out the functions of the seed certification agency according to the provisions of the Central Seed Act 1966 and Seed Rules 1968 to ensure the quality of the certified seeds produced in the State.

Seed Certification is a regulatory process designed to secure, maintain and make available the prescribed levels of seed quality involving germination, physical purity, genetic purity and seed health. These quality attributes are ensured by way of verification of source materials used for seed production, carrying field inspections at the appropriate crop stages, supervising the harvest and post harvest operations, sampling, testing and tagging the seed lots and finally grant of certificate for the seed lots possessing minimum required
standards. There are 11 Assistant Directors of Seed Certification functioning under 4 Regional Deputy Directors of Seed Certification who are under the control of the Director of Seed Certification, Coimbatore. There are 151 Seed Certification Officers. With this overall strength, the annual average certified seed production is 42,811 tonnes. During 2003-04 it is programmed to produce 45,000 tonnes of certified seeds.

4.6.2 Central Seed Laboratory

In this section it 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.

4.6.3 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 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.

4.6.4 Seed Inspection

The basic object of the Seed legislation is to regulate the quality of seeds sold to farmers by government and private agencies and individual farmers. The Seed Inspection wing of this department is in charge of regulating the seeds sold in accordance with the provisions of Seed Act 1966, Seed Rules 1968 and Seeds (Control) Order 1983. To ensure the quality of the seeds distributed to the farmers, seed selling points are inspected periodically and seed samples are drawn and sent for analysis to the notified Seed Testing Laboratory and based on the results, legal action is initiated against the defaulters. Besides this, the Seed Inspection wing is issuing licences for Seed dealers under Seed (Control) order 1983.

4.6.5 Quality Seed Testing

Quality of Seed testing is being carried out to analyse the quality of the “seed lots” as per the handbook on seed testing released by Government of
India. Seed testing is the cornerstone for the successful implementation of Seed Certification programs and seed law enforcement. There are seven notified Seed testing laboratories functioning in the State with an annual capacity of testing 42,000 seed samples. Besides certified seed samples and official seed samples of Seed Inspection wing, the service samples sent by the farmers, seed dealers and Seed producers are also being tested in these laboratories.

As against the annual capacity of testing 42,000 seed samples, 59,216 seed samples were tested during 2000-01. 52,000 samples are likely to be tested during 2002-03. It is programmed to test 56,000 seed samples during 2003-04.

Seed testing is done in these laboratories as per the rules of International Seed Testing Association and as per the guidelines of the Central Seed Testing laboratory, New Delhi. The genetic purity of the Seed lots are being tested by grow out tests conducted at Kannampalayam farm and at glass house attached to the Directorate of Seed Certification.

4.6.5.1 Quality testing of Seed

The seed testing is being carried out to analyse the quality of the seed lots. The factors like germination physical purity moisture seed health and admixture of other distinguishable varieties are being analysed in the notified seed testing laboratories. The Seed testing results are significantly important for the successful implementation of Seed Certification programs and seed law enforcement programs.

4.6.6 Training

The vital aspects on quality seed production and regulatory aspects on seed selling are covered in the Orientation and Refresher training programs and training to seed producers and quality control training to seed dealers organized by the Training Wing of this department. During 2000-01, as against the target of 24,500 persons to be trained 25,591 persons were trained and 25,000 persons will be likely trained during the 2002-03. In 2003-04, it is programmed to impart training to 26,000 persons.
4.7 SEED PRODUCTION SYSTEM IN INDIA

The Indian seed programme largely adheres to the limited generations’ system for seed multiplication in a phased manner. The system recognizes three generations namely breeder, foundation and certified seeds and provides adequate safeguards for quality assurance in the seed multiplication chain to maintain the purity of the variety as it flows from the breeder to the farmer. Seeds of only those varieties which are notified under section under Section 5 of the seeds act shall be eligible for certification.

4.7.1 Breeder Seed

Breeder seed is the progeny of nucleus seed of a variety and is produced by the originating breeder or by a sponsored breeder. Breeder seed production is the mandate of the Indian Council of Agricultural Research (ICAR) and is being undertaken with the help of:

- ICAR Research Institutions, National Research Centers and All India Coordinated Research Project of different crops;
- State Agricultural Universities (SAUs) with 14 centers established in different States;
- Sponsored breeders recognized by selected State Seed Corporations, and
- Non-Governmental Organizations.

4.7.2 Foundation Seed

Foundation seed is the progeny of breeder seed and is required to be produced from breeder seed or from foundation seed which can be clearly traced to breeder seed. The responsibility for production of foundation seed has been entrusted to the NSC, SFCI, State Seeds Corporation, State Departments of Agriculture and private seed producers, who have the necessary infrastructure facilities. Foundation seed is required to meet the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards, both at the field and laboratory testing.

4.7.3 Certified Seed

Certified seed is the progeny of foundation seed and must meet the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards, 1988. In case of self pollinated crops, certified seeds
can also be produced from certified seeds provided it does not go beyond three generations from foundation seed stage-I.

The production and distribution of quality/certified seeds is primarily the responsibility of the State Governments. Certified seed production is organized through State Seed Corporation, Departmental Agricultural Farms, and Cooperatives and so on. The distribution of seeds is undertaken through a number of channels i.e. departmental outlets at block and village level, cooperatives, outlets of seed corporations, private dealers etc. The efforts of the State Governments are being supplemented by NSC and SFCI which produce varieties of national importance. NSC markets its seeds through its own marketing network and also through its dealer network. SFCI markets its seeds mainly through the State Departments of Agriculture and the State Seed Corporations.

- Seed act section 9 provides any person desires of producing certified seed shall register his name with concerned seed certification agency duly remitting the prescribed fee in form No.1 for grant of certificate. Certificate could be granted in form No.11 after meeting the requirement of certification agency prescribed under Part VII clause 15,16 and 17 of Seed rule.

- It should have the minimum genetically purity of 99%

- Certified seed may be the progeny of certified seed, provided this reproduction does not exceed two generations beyond foundation seed and provided that if certification agency determines the genetic and physical purity, if not be significantly altered.

- In case of highly self pollinated crops certification of one further generation may be permitted.

- Certified seed produced from certified seed, shall be eligible for further seed increase under certification, except in case of highly self pollinated crops, where certification of one further generation may be permitted.

- Certification tags issued once for certified seed not eligible for further seed increase under certification.
• For paddy and wheat, certified seed produced from certified seed is eligible for certification by NSC up to two generations from foundation seed.

4.8 QUALITY CONTROL ARRANGEMENTS ON SEEDS

This component deals with arrangement to regulate the quality of seeds under the Seeds Act, 1966, to strengthen quality control organization like State Seed Certification Agencies, State Seed Testing Laboratories, Central Seed Testing Laboratory and Central Seed committee apart from imparting training to officials engaged in the seed sector and for enforcing the seed law in order to ensure the production and distribution of quality seeds to protect the interest of the farmers. This component also deals with the strengthening of National Seeds Research and Training Centre at Varanasi (UP) This Centre is accredited as Central Seed Testing Laboratory and acts as referral seed testing laboratory as well as a premier training centre on all aspects of seed technology to different stakeholders.

This component also aims to provide financial support to Central Seeds Testing Laboratory (CSTL) to perform the following functions: (i) to initiate testing programme in collaboration with notified State Seed Laboratories, design to provide uniformity in test results between all recognized seed labs in India; (ii) to collect data continually on the status of seed sold in the market and to make this data available to Central Seed Committee; (iii) to coordinate and standardize the seed testing procedure in the country.

4.9 AMMA SEEDS’ SCHEME FOR FARMERS

• Government of Tamil Nadu to benefit farmers launched “Amma seeds” scheme on January 2, 2016.

• ‘Amma Seeds’ scheme is aimed at providing quality seeds to the farmers.

• For availability of certified ‘Amma Seeds’ would set up “Amma Service Centres’ across the state.
The Tamil Nadu Seeds Development Agency (TNDSA) will act as the nodal body to coordinate seed farms, production units and the farmers.

The motive of the scheme is to encourage farmers to use certified seed.

Urban residential area will be encouraged to produce Vegetable above the roofs of the houses.

The scheme, which involves providing kits with necessary ingredients to people to try out vegetable farming in urban environment, has been successfully implemented in Chennai and Coimbatore following its launch last year.

Under agriculture department initiatives, the CM inaugurated a series of buildings including dry and cold storage facilities constructed at an estimated Rs. 28.51 crore.

4.9.1 Assistance for Boosting Seed Production in the Private Sector

Under this component, credit linked back-ended capital subsidy is provided at the rate of 25per cent of the project cost subject to a maximum limit of Rs. 25.00 lakh per unit on seed infrastructure development. Private Companies, individual entrepreneurs, self-help groups, seed co-operatives and partnership farms are eligible for subsidy. The component is implemented through Nationalised Banks/Scheduled Commercial Banks and National Co-operative Development Corporation (NCDC). The assistance is for creation of infrastructure facilities relating to seed cleaning, grading, processing, seed treating, packaging and storage units as well as for seed testing facilities. This assistance is primarily for low value and high volume seeds. National Seed Corporation is the nodal agency for implementation and monitoring of this component

4.9.2 Seed Village Scheme

To upgrade the quality of farmer-saved seed, which is about 80-85per cent of the total seed used for crop production programme, financial assistance is provided for distribution of foundation/certified seed at 50per cent cost of the
seed of crops for production of certified/quality seeds only and for training on seed production and technology to the farmers.

The seed produced in these seed villages are preserved /stored till the next sowing season. In order to encourage farmers to develop storage capacity of appropriate quality, assistance is given to farmers for making/procuring of Pusa Bin/Mud bin/Bin made from paper pulp for storing of seed produced by the frames on their farms.

4.10 QUALITY MANAGEMENT

4.10.1 Production of Certified Seeds in Nagapattinam District

In the study area, paddy seeds have been largely produced and seeds are standardised and certified as per the provision of the relevant Acts of the Acts. The Government of Tamilnadu has in croporosed facilities for grading certificates for the paddy and other agricultural seeds. The formation relarty to quality management of agricultural seeds in the study area in descried in the following pages of this chapter

4.10.2 Breeder Seeds Farm in Nagapattinam District

In the Nagapattinan District the farmers are encouraged by the agricultural department to produce breeder seed of different crops. For the production of breeder seed the cultivators have to register with the agricultural department. Only on the basis of registration and under the monitoring of officials of the agricultural department the breeder seed can be produced and it can be sold to the government department. At the time of sowing the seeds and at the time of harvesting the field officers of the agricultural department visit the registered land and give suggestions to the farmers. The field officers will make intermittent visits also during the process of cultivation. The following table provides information regarding the isolation distance between one variety to other variety. The crop produced in the isolation distance will not be considered as pure variety of seeds and hence it cannot be included under the breeder seeds because they are not breeder seeds. The table also shows the seeds quality in terms of disease resistance
Table 4.1
Breeder Seeds Farm in Nagapattinam District during the 2015

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Crops</th>
<th>Field Inspection</th>
<th>Speed Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Isolation Distance (metre)</td>
<td>Off Type (%)</td>
</tr>
<tr>
<td>1</td>
<td>Paddy</td>
<td>3</td>
<td>0.05</td>
</tr>
<tr>
<td>2</td>
<td>Sorghum</td>
<td>200</td>
<td>0.05</td>
</tr>
<tr>
<td>3</td>
<td>Black gram</td>
<td>10</td>
<td>0.10</td>
</tr>
<tr>
<td>4</td>
<td>Green gram</td>
<td>10</td>
<td>0.10</td>
</tr>
<tr>
<td>5</td>
<td>Groundnut</td>
<td>3</td>
<td>0.10</td>
</tr>
<tr>
<td>6</td>
<td>Sesame</td>
<td>100</td>
<td>0.10</td>
</tr>
<tr>
<td>7</td>
<td>Sunflower</td>
<td>400</td>
<td>0.10</td>
</tr>
<tr>
<td>8</td>
<td>Cotton</td>
<td>50</td>
<td>0.10</td>
</tr>
<tr>
<td>9</td>
<td>Hybrid Cotton</td>
<td>50</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Source: Office Record for Agricultural Department Nagapattinam-2014

4.10.3 Certified Seeds Farm in Nagapattinam District

In study area certified seed also produced by the registered farmers. Generally the foundation seed are produced from the breeder seed. The seed produced by the farmers are graded and the these varieties are good quality and considered as the foundation seeds and authority of agricultural department certifies that they are quality seeds and amenable for agricultural production. Generally the government department is selling only the certified seeds and the certified seed are packed in different quantities and along with the packages labels are attached. In the label quality of seed in the package the variety etc., are certified by the concerned quality test inspectors. Who is authorized to do so by the Act. The following table provides information regarding the field inspection by the field officer of agricultural department and the seed quality at the time of inspection.
Table 4.2
Certified Seeds Farm in Nagapattinam District during the year 2015

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Crops</th>
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</tr>
<tr>
<td>1</td>
<td>Paddy</td>
<td>3</td>
<td>0.20</td>
</tr>
<tr>
<td>2</td>
<td>Sorghum</td>
<td>100</td>
<td>0.10</td>
</tr>
<tr>
<td>3</td>
<td>Black gram</td>
<td>5</td>
<td>0.20</td>
</tr>
<tr>
<td>4</td>
<td>Green gram</td>
<td>5</td>
<td>0.20</td>
</tr>
<tr>
<td>5</td>
<td>Groundnut</td>
<td>3</td>
<td>0.20</td>
</tr>
<tr>
<td>6</td>
<td>Gingirly</td>
<td>50</td>
<td>0.20</td>
</tr>
<tr>
<td>7</td>
<td>Sunflower</td>
<td>200</td>
<td>0.20</td>
</tr>
<tr>
<td>8</td>
<td>Cotton</td>
<td>30</td>
<td>0.20</td>
</tr>
<tr>
<td>9</td>
<td>Hybrid Cotton</td>
<td>30</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Source: Office Record for Agricultural Department Nagapattinam-2014

Certified seed farm may be the progeny of certified seed, provided this reproduction does not exceed two generations beyond foundation seed and provided that if certification agency determines the genetic and physical purity, if not be significantly altered.
4.10.4 Quality Analysis of Seeds (Days)

The field inspector visit the seed farms and testing the crops and informing the cultivated about the health of plants. The following table provides information regarding the number of days of the crop, the field officer visit and made inspection about the quality of the crops.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Crops</th>
<th>No. of Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paddy, Cluster been, Tomato, Chilly,</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Cotton</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Sunflower, Groundnut, Sorghum</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Rahi, Green gram, Cowpea, Soya been</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Maize, Cambu, Black gram</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Red gram, Sesame</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Horse gram</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Office Record for Agricultural Department Nagapattinam-2014
Table 4.4
Quantity of paddy seed Certified in Nagapattinam district

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Years</th>
<th>Seed Production Registered Area (Hectare)</th>
<th>Certified Seed, Quantity (Metric. Tone)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2004-05</td>
<td>32447</td>
<td>43216</td>
</tr>
<tr>
<td>2</td>
<td>2005-06</td>
<td>27724</td>
<td>41325</td>
</tr>
<tr>
<td>3</td>
<td>2006-07</td>
<td>24634</td>
<td>41331</td>
</tr>
<tr>
<td>4</td>
<td>2007-08</td>
<td>33081</td>
<td>48269</td>
</tr>
<tr>
<td>5</td>
<td>2008-09</td>
<td>36260</td>
<td>56074</td>
</tr>
<tr>
<td>6</td>
<td>2009-10</td>
<td>36066</td>
<td>60597</td>
</tr>
<tr>
<td>7</td>
<td>2010-11</td>
<td>36507</td>
<td>60633</td>
</tr>
<tr>
<td>8</td>
<td>2011-12</td>
<td>42562</td>
<td>67288</td>
</tr>
<tr>
<td>9</td>
<td>2012-13</td>
<td>46952</td>
<td>79473</td>
</tr>
<tr>
<td>10</td>
<td>2013-14</td>
<td>55650</td>
<td>93551</td>
</tr>
</tbody>
</table>

Source: Office Record for Agricultural Department Nagapattinam-2014

The table 4.4 shows the registered area of seed cultivation and quantity of certified seed produced in the Nagapattinam district during the period from 2004-05 to 2013-14. The registered area was 32447 hectares during 2004-05 and was increased to 55650 hectares during 2013-14. At the same time the quantity of certified seed produced was 43216 metric tons during 2004-05, and it was increased to 93551 metric tons during 2013-14. From this it can be observed that the area of seed cultivation was increased by 20 percent during the ten-year period but the quantity produced was increased by almost 120 percent. This shows that the productivity of the land used for seed cultivation has been increasing in the study area. It may be due to the use of improved variety of seed and the technique used in the cultivation.
### Table 4.5

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Years</th>
<th>No. of Samples Taken for Quality Test (Number)</th>
<th>No. of accepted Seed Samples (Number)</th>
<th>No. of Rejected Seed Samples</th>
<th>No. of Rejected Seed Samples (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2004-05</td>
<td>59216</td>
<td>54499</td>
<td>4717</td>
<td>7.9</td>
</tr>
<tr>
<td>2</td>
<td>2005-06</td>
<td>51193</td>
<td>47894</td>
<td>3299</td>
<td>6.4</td>
</tr>
<tr>
<td>3</td>
<td>2006-07</td>
<td>47911</td>
<td>44589</td>
<td>3322</td>
<td>6.9</td>
</tr>
<tr>
<td>4</td>
<td>2007-08</td>
<td>49591</td>
<td>46604</td>
<td>2987</td>
<td>6.0</td>
</tr>
<tr>
<td>5</td>
<td>2008-09</td>
<td>55215</td>
<td>51252</td>
<td>3963</td>
<td>6.6</td>
</tr>
<tr>
<td>6</td>
<td>2009-10</td>
<td>59870</td>
<td>55838</td>
<td>4032</td>
<td>6.7</td>
</tr>
<tr>
<td>7</td>
<td>2010-11</td>
<td>62933</td>
<td>58953</td>
<td>3980</td>
<td>6.3</td>
</tr>
<tr>
<td>8</td>
<td>2011-12</td>
<td>68211</td>
<td>62452</td>
<td>5759</td>
<td>8.4</td>
</tr>
<tr>
<td>9</td>
<td>2012-13</td>
<td>56008</td>
<td>50511</td>
<td>5497</td>
<td>9.8</td>
</tr>
<tr>
<td>10</td>
<td>2013-14</td>
<td>85334</td>
<td>79595</td>
<td>5739</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Source: Office Record for Agricultural Department Nagapattinam-2014

Table No 4.5 depicts that classification of certified seed during the ten years from 2004-05 to 2013-14, number of samples taken for quality test shows an increasing trend 47911 to 85334 numbers in 2006-07 to 2013-14 except in 2012-13 followed by number of accepted seed samples 44589 to 79595 numbers in 2006-07 to 2013-14 except in 2012-13, number of rejected seed samples major fluctuations in 2004-05 to 2013-14 and number of rejected seed samples percentages there were major fluctuations in 2004-05 to 2013-14.

### 4.11 SUMMARY

The foregone pages of this chapter were describing the various government regulations such as the seed Act and various seed rules and also the chapter shows the seed production system and quality control and management in India. The second part of this chapter was described the quality management of certified seeds in Nagapattinam District.