

Generation system of seed multiplication;
maintenance of Nucleus seed, production of
Breeder, Foundation and Certified seed

Scope of Seed Technology

- 1. Provision of scientific technique for Seed production .**
- 2. Provision of guidelines to maintain the seed certification standards.**
- 3. Adequate and timely supply of seeds on the market.**
- 4. Provision of technical knowledge to check the govt. statutory guidelines of seed standards.**

Classes of seed

- **Nucleus or Basic Seed**
- **BREEDER SEED**
- **FOUNDATION SEED**
- **CERTIFIED SEED**

STAGES OF SEED PRODUCTION

Nucleus Seed



BREEDER SEED



FOUNDATION SEED

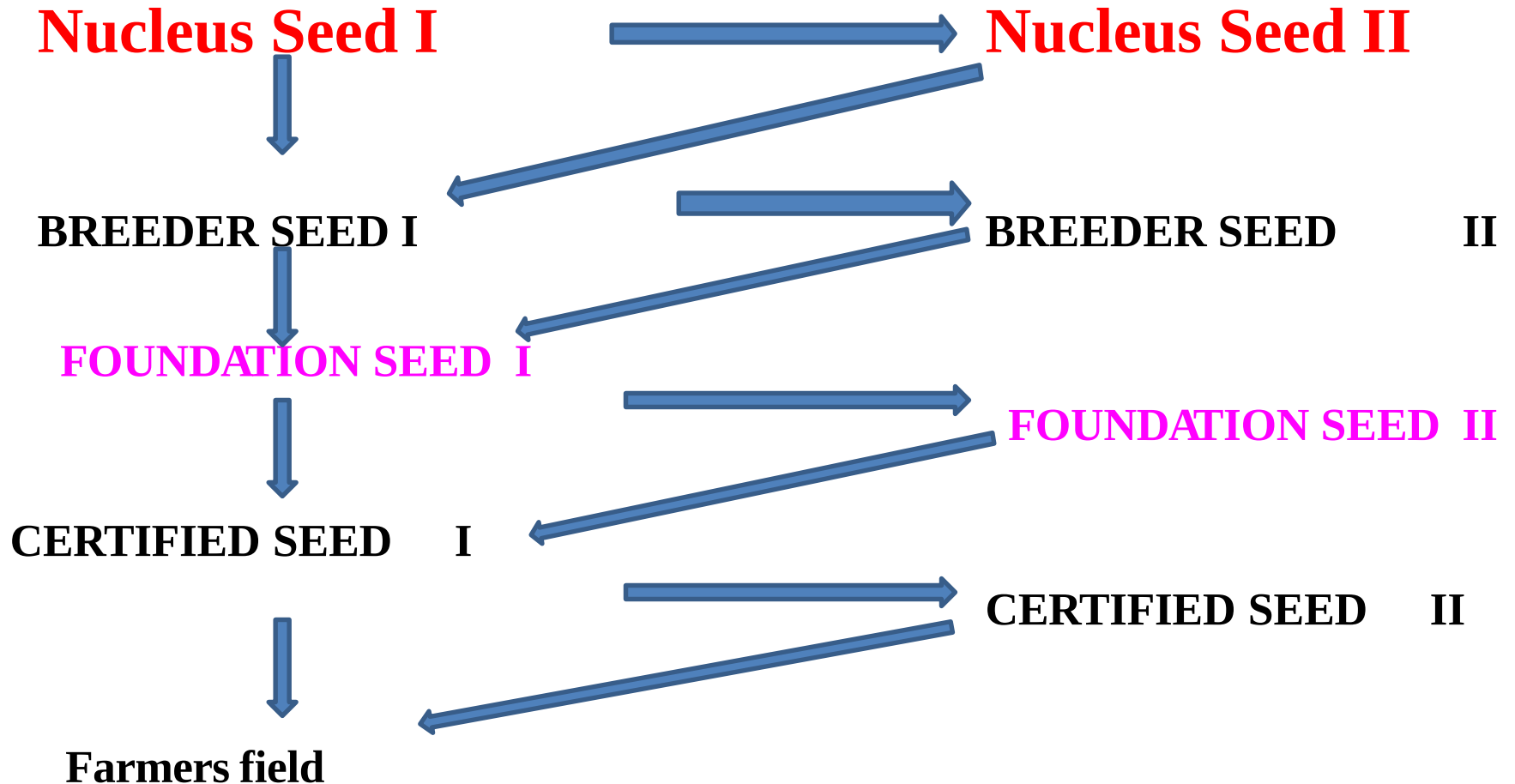


CERTIFIED SEED



Farmers field

Stages II of Seed production



Seed multiplication system

- **A. Three - Generation model**

Breeder seed - Foundation seed - Certified seed

- **B. Four - Generation model**

Breeder seed - Foundation seed (I) Foundation seed (II) -
Certified seed

- **C. Five - Generation model**

Breeder seed - Foundation seed (I)- Foundation seed (II) -
Certified seed (I) – Certified seed (II)

Generation system

- ❖ Seed production is restricted to four generations only
- ❖ Starting from breeder's seed, the seed can only be multiplied up to 3 more generations i.e. Foundation, Registered & certified

Important safeguards for maintaining Nucleus seed production

- ❖ Control of seed source
- ❖ Preceding crop requirements
- ❖ Isolation
- ❖ Rouging of seedfields
- ❖ Seed certification
- ❖ Grow-out test

Control of seed source

Association of Official Seed Certifying Agencies (AOSCA)

recommended 4 classes of seeds

1. Breeder's Seed
2. Foundation Seed
3. Registered Seed
4. Certified Seed

Breeder's Seed:

- Directly controlled by the original breeder, sponsoring breeder or institution and which provides for the initial & recurring increase of foundation seed.

Foundation Seed:

- Include seed stock so handled as to most nearly maintain specific genetic identity & purity and that may be designated of distributed by an agricultural experiment station.
- It is the source of all certified seeds, either directly or through registered seed

Registered Seed:

- It is progeny of foundation or registered seed
- It is so handled as to maintain satisfactory genetic identity & purity and that has been approved and certified by a certifying agency.
- This class of seed should be of a quality suitable for production of certified seed

Certified Seed:

- It is progeny of foundation, registered or certified seed that is so handled to maintain satisfactory genetic identity & purity and that has been approved & certified by certifying agency.

Planning for Breeder Seed production.

- 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 Centres .
 - All India Coordinated Research Project of different crops

- State Agricultural Universities (SAUs) with centres established in different States.
 - Sponsored breeders recognized by selected State Seed Corporations.
 - Non-Governmental Organizations.
 - ICAR also promotes sponsored breeder seed production programme through the National Seeds Corporation (NSC) / State Farms Corporation of India (SFIC), State Seeds Corporation (SSCs), Krishi Vigyan Kendras (KVKs) etc.
- There has been a steady increase in the production of breeder seed over the years.

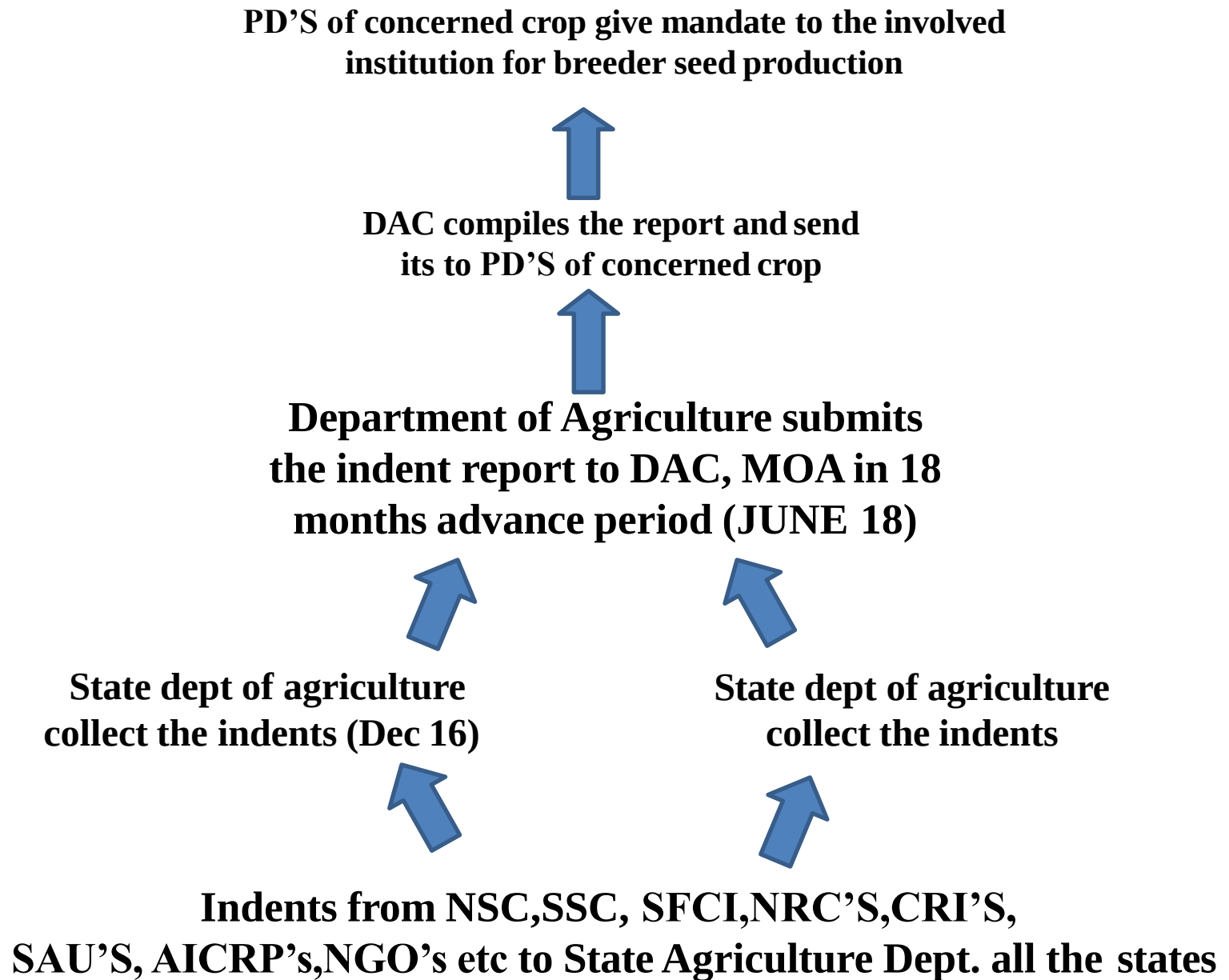
Plan of Breeder Seed Production

- The indents from various seeds producing agencies are collected by the State Departments of Agriculture.
- State Departments of Agriculture submits the seeds indent demand to the Department of Agriculture and Cooperation (DAC) Ministry of Agriculture, Government of India.
- DAC compiles the whole information crop wise and sends it to the Project Coordinator/Project Director of the respective crops in ICAR for final allocation of production responsibility to different SAUs/ICAR institutions.
- The allocation of responsibility for production of breeder seed is discussed in the annual workshop in respect of the particular crop and is made to various centre's as per the facilities and capabilities available at the centre's and the availability of nucleus seed of a particular variety.
- It may be noted that indents are compiled and forwarded to ICAR at least 18 months in advance.

Contd...

To the Programme systematic and for proper evaluation of the breeder seed production programme, monitoring teams have been constituted and reporting proformae have been devised. The monitoring teams consist of breeder of the variety, the concerned Project Director or his nominee, representative of NSC.

- The production of breeder seed is reviewed every year by ICAR-DAC in the annual seed review meeting.
- The actual production of breeder seed by different centres is intimated to DAC by ICAR.
- On receipt of information from ICAR, the available breeder seed is allocated to all the indenters in an equitable manner.
- In the case of varieties which are relevant only to a particular State, the indents for breeder seed are placed by the concerned Director of Agriculture with the SAUs/ICAR institutions located in the State.
- The breeder seed produced is lifted directly by the Director of Agriculture or foundation seed producing agencies authorized by him.



Plan of Foundation Seed Production

- Foundation seed is the progeny of breeder seed .
- Foundation seed is required to be produced from breeder seed or from FOUNDATION SEED STAGE – I which can be clearly traced to breeder seed.
- The responsibility for production of foundation seed has been entrusted to the agencies mentioned:
 - a. NSC (National Seed Corporation Ltd.)
 - b. SFCI (State farms Corporation of India Ltd.)
 - c. SSC (State Seeds Corporation Ltd)
 - d. State Departments of Agriculture
 - e. Private seed producers
 - f. SAU (State Agricultural Universities)
 - g. KVK (Krishi Vigyan Kendra)
- Agencies 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.

Plan of Certified Seed Production

- 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, Cooperatives etc.
- The requirement of certified/quality seeds is assessed by State Governments on the basis of the area sown under different crop varieties,
- Area covered by hybrid and self-pollinated varieties as well as the seed replacement rate achieved.

Contd...

- The availability of foundation seed is ascertained by the State Departments of Agriculture on the basis of the production of seed in government farms and production of seeds by State Seeds Corporations and other agencies.
- The Government of India periodically assesses the requirement and availability of seeds through detailed interaction with State Governments and seed producing agencies in the bi-annual Zonal Seed Review Meetings and the National Kharif and Rabi Conferences.
- The Department of Agriculture and Cooperation facilitates tie-up arrangements with seed producing agencies to ensure that the requirement of seeds is met to the maximum extent possible.
- The efforts of the State Governments are being supplemented by NSC and SFCI which produce varieties of national importance.

Contd...

- 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.
- 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.
- SFCI markets its seeds mainly through the State Departments of Agriculture and the State Seed Corporations.

Contd...

- 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 production of certified seed by NSC and State Seed Corporations is mainly organized through contract growing arrangements with progressive farmers.
- SFCI undertakes seed production on its own farms.
- The private sector has also started to play an important role in the supply of quality seeds of vegetables and crops like hybrid maize, sorghum, Bajra, cotton, castor, sunflower, paddy etc.

Importance of Seed Production

- Multiplication of superior varieties.
- Availability of superior varieties to masses
- Maintenance of genetic purity.
- Supply of high quality seeds with excellent quality.
- Seeds have high germination status.
- Seeds have high vigour and viability status.
- Seeds have high physical purity.
- It maintains the excellent health status of seed

Colour of certification tags for different classes of seeds

1. Basic or Nucleus seed: Tag is not used Certificate given by breeder
2. Breeder seed: **Golden brown**

A/04/060

Tamil Nadu Agricultural University, Coimbatore

Crop : Groundnut
Variety : VRI 2
Class of Seed : BREEDER SEED
Lot No : 9/14/05
Date of Test : 24.11.05
Pure Seed : 55%
Inert matter : Nil
Germmination : 80%
Genetic Purity : 100%
Net Wt. : 30g
Producing Institution : [Signature]
[Signature]
[Signature]

3492 N ONE

POISON TREATED

Assistant Professor
(Plant Breeding)
Regional Research Station
Tamil Nadu Agricultural University
Vriddhachalam-606 001.

AREA MANAGER (PST)
AEW OF TANCOP
DEPT. OF AGRICULTURE
MEYVELL 632 817

3. Foundation seed : White tag

A/102/05-06

TAMIL NADU		CERTIFIED SEEDS	
VARIETY	COW PEA		செயல்பாட்டு முறை PPD
VARIETY	PUSA-152		
LOT NO.	Area 4-22-P34-35		
CLASS OF SEED	FOUNDATION STAGE		
CERTIFICATION NO.	A126/04-05		331674
DATE OF ISSUANCE	14-9-04		
DATE OF RECEIPT	13-6-05		
USE OF THE SEED AFTER EXPIRY OF THE VALIDITY PERIOD BY ANY PERSON IS ENTIRELY AT HIS RISK AND THE HOLDER OF THE CERTIFICATE SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE TO THE BUYER OF SEEDS WHO MAY PURCHASE THE SEEDS OF THE CERTIFICATION TAG HAS BEEN IMPERFECTED WITH			
IF PROVIDED SEED IS STORED UNDER COOL AND DRY ENVIRONMENT			
NAME AND FULL ADDRESS OF THE PRODUCER	A.D.P. POLLACHI		
NET WEIGHT	8 kgs		
CERTIFIED TAMIL NADU SEED CERTIFICATION OFFICER'S SIGNATURE			
V. ELANGO B.Sc. (Ag.) Seed Certification Officer, 125, Pollachi - II			

4.Certified seed: Blue

[shade ISI No.104 Azure blue]



NATIONAL ORGANIZATIONS

- **NATIONAL SEED RESEARCH AND TRAINING CENTRE, VARANASI** (Responsible for Quality Seeds Availability, Testing & Quality Control At National Level)
- **STATE FARMS CORPORATION OF INDIA LTD. (SFCI)**, (Responsible for Quality Seeds Availability by the seed production programme on various states)
- **NATIONAL SEEDS CORPORATION LIMITED**
(Responsible for seed production of certified & foundation class)



Thank You