

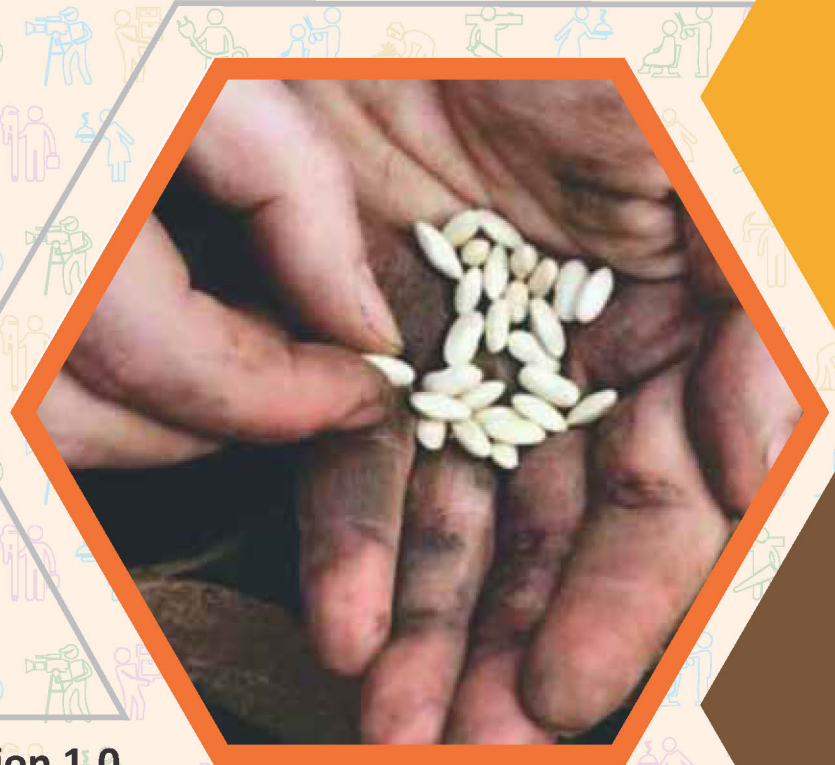
# Participant Handbook

Sector  
**Agriculture and Allied**

Sub-Sector  
**Agriculture Industries**

Occupation  
**Quality Seed Grower**

Reference ID: **AGR/Q7101, Version 1.0**  
**NSQF Level 4**



**Quality Seed Grower**

### Published by

Mahendra Publication Pvt. Ltd  
E-42,43,44,Sector-7 Noida -201301,  
Uttar Pradesh -India

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First Edition, March 2016

ISBN 978-1-111-22222-45-7

Printed in India at

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**Shri Narendra Modi**  
Prime Minister of India

“ Skilling is building a better India.  
If we have to move India towards  
development then Skill Development  
should be our mission. ”



## Certificate

### COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**AGRICULTURE SECTOR SKILL COUNCIL**

for

**SKILLING CONTENT : PARTICIPANT HANDBOOK**

Complying to National Occupational Standards of  
Job Role/ Qualification Pack: 'Quality Seed Grower' QP No. 'AGR/ Q7101 NSQF Level 4'

Date of Issuance: **May 13<sup>th</sup>, 2016**

Valid up to\*: **March 31<sup>st</sup>, 2018**

*\*Valid up to the next review date of the Qualification Pack or the  
'Valid up to' date mentioned above (whichever is earlier)*

Authorised Signatory  
(Agriculture Skill Council of India)

## Acknowledgements

We are thankful to all organizations and individuals who have helped us in preparation of this Participant manual. We also wish to extend our gratitude to all those who reviewed the content and provided valuable inputs for improving quality, coherence and content presentation of chapters. This handbook will lead to successful roll out the skill development initiatives, helping greatly our stakeholders particularly trainees, trainers and assessors etc. We are thankful to our Subject Matter Expert Dr. N.Emayavaramban who has given the content and helped us in preparation of Participant Handbook.

It is expected that this publication would meet the complete requirements of QP/NOS based training delivery, we welcome the suggestions from users, Industry experts and other stakeholders for any improvement in future.

## About this book

A Quality Seed Grower will be responsible for producing foundation and multiplication seeds according to pre-determined standards and systems while maintaining its genetic purity as per the Quality Seed Grower Qualification Pack (QP). The individual at work cultivates breeder seeds to produce foundation seeds and foundation seeds to produce multiplication seeds of crops by undertaking recommended practices and methods. As per these standards the Quality Seed Grower should have good eyesight and observation ability, attention to details, ability to work independently as well as under expert's supervision, quality orientation, health safety, willingness to wear protective gears and the stamina for long hours of work in different environmental conditions. The trainee will enhance his/her knowledge under the guidance of the trainer in the following skills:

- **Knowledge and Understanding:** Adequate operational knowledge and understanding to perform the required task
- **Performance Criteria:** Gain the required skills through hands on training and perform the required operations within the specified standards
- **Professional Skills:** Ability to make operational decisions pertaining to the area of work.

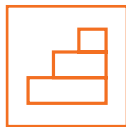
The handbook incorporates well-defined roles for producing foundation and multiplication seeds according to pre-determined standards and systems while maintaining its genetic purity. This job-role requires the participant to work independently and be comfortable in making decisions pertaining to his/her area of work. Further it requires clarity, skill to basic arithmetic and algebraic principles too. The participant should be result oriented and responsible for his/her own working and learning. The participant should also be able to demonstrate skills of using various tools and decision making for instant problem solving.

We wish all the best for your future.

## Symbols Used



Key Learning Outcomes



Steps



Time



Tips



Notes



Unit Objectives



Exercise

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# 1. Introduction

Unit 1.1 - Introduction of seed industry in India

Unit 1.2 - Different Types of seed and characteristic of quality seed

Unit 1.3 - Basic principles in the production of various types / class of seed



## Key Learning Outcomes



**At the end of this module, you will be able to:**

- Discuss about the concept of quality seed
- The quality parameters which differentiate a seed from the grain.
- The characteristics of various class of seeds and its production at the field.
- Define the Importance of Indian seed Act and Indian Minimum seed certification standards.

## UNIT 1.1: Introduction Of Seed Industry In India

### Unit Objectives

At the end of this unit, you will be able to:

- Check the productivity of superior crop varieties from indigenous varieties
- Identify various steps taken by the Government in developing the seed industry.

### 1.1.1 General Instructions to Trainee

- Greet your instructor and other participants when you enter the class
- Always be punctual for every class
- Be regular
- Inform your instructor if, for any reason, you need to miss class
- Pay attention to what your instructor is saying or showing
- If you do not understand something, put up your hand and seek clarification
- Make sure you do all exercises at the end of each module in this book. It will help you understand the concepts better
- Practice any new skills you have learnt as many times as possible
- Make sure you are neatly attired and presentable at all times
- Participate actively in all activities, discussions and games during training
- Bath daily, wear clean clothes and comb your hair before you come to class

The three most important words you must always remember and use in your daily conversation are **'please', 'thank you', and 'sorry'**

### 1.1.2 Introduction

In olden days crops were grown sowing seeds of indigenous crop varieties selected from the commercial produce to meet the demand for food. Superior crop varieties were produced to meet higher demand for food due to increase in population. The yield performance of the superior varieties was higher when pure and cleaned seed was used. The better performance of superior varieties was scientifically proved and was attributed to the genetic purity and good physical purity of seed.

This better performance of improved varieties attracted Govt. attention who took various steps to establish and perfect the scientific method of production and distribution of quality seed. Accordingly Government of India and state Governments initiated various steps simultaneous to develop seed industry. Emphasis was given in the Five year plans for seed development programme. The Scientific approach for production and distribution of quality seed started with setting up of All India coordinated crop improvement programme. Indian Council of Agriculture Research (ICAR) being the apex organization for research in agriculture, first started All India Maize Coordinated programme which set the tone for quality seed production. Subsequently a number of crop development programmes were initiated for crops like sorghum, paddy, wheat etc. More superior / high yielding varieties were released from the coordinated programme.

National Seeds Corporation (NSC) was started in 1963, which acted as the leader in the production and distribution quality seed to farmers. NSC played a key role in all policy making and implementation of Government schemes to improve seed industry in India. It also played a key role in framing the Minimum Seed Certification standard for various crops. Subsequently Tarai Development corporation (UPSTDC) was also established by the Uttar Pradesh State Government which also played a key role.

State seed corporations (SSCs) were established by various state Governments to meet the demand in the respective state. To ensure quality seed production Seed, Certification Agencies were also established by various states government to monitor the quality of seed and attend certification. State Agriculture universities were established to undertake research work in crop improvement who have released a number of superior varieties and produced Breeder seed of those varieties released by them.

### 1.1.2 Indian Seed Act

Indian seed Act 1966 is the supreme law for the seed industry in India. The act – aims

- a) To regulate the quality of seed which are meant for sale. (mainly F/S and C/S) and to ensure that farmers are not cheated.
- b) To regulate functioning of all agencies / dealers dealing with any notified variety seed
- c) This act is applicable for F/S and C/S and only for varieties notified by Govt. of India.
- d) To regulate establishment of seed testing laboratory by the State Governments and procedure adopted by these laboratories for seed testing.
- e) It has provision for punishing any seed dealer or seed producer who indulge in mal practices.

**Exercise**



1. Do you have any idea about green revolution?

Answer: -----  
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2. If so can you link the role of quality seed in this revolution?

Answer:-----  
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3. What was the most important character introduced in paddy and wheat crop that led to green revolution?

Answer:-----  
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**Tips** 

- Indian Seed market is one of the largest seed market, dominated by open pollinated varieties
- The Indian seed market is majorly contributed by non-vegetable seeds such as corn, cotton, paddy, wheat, sorghum, sunflower and millets.
- NSC- National Seed Corporation
- SSC- State Seed Corporation

**Notes** 

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## UNIT 1.2: Different types of seed and characteristic of quality seed

### Unit Objectives

At the end of this unit, you will be able to:

- Identify the class of seed produced based on the size of seed production field.
- Select the right class of parental seed to be used for the seed production programme assigned to you.
- Discuss about the responsibility of the seed certification agency in seed production and maintenance of seed quality.
- Differentiate genetic and physical purity, and plan for maintaining purity.
- Discuss about the seed production chain followed in India.

### 1.2.1 Different Types of Class of Seed

There are 5 types / class of seed:

- a) Nucleus seed (N/S)
- b) Breeder seed (B/S)
- c) Foundation seed (F/S)
- d) Certified seed (C/S)
- e) Truthfully labeled seed. (T/L)

**Nucleus seed:** Initial amount of quality seed for any seed production programme which always has 100% genetic and physical purity. Produced directly by the breeder who either released the variety concerned or assigned by ICAR to produce N/S.

#### Breeder Seed

B/S is produced from N/S by the breeder nominated by the ICAR directly under his supervision. Also has 100% genetic and physical purity. The breeders nominated for this seed production are mainly from the Indian Council of Agriculture (ICAR), State Agriculture Universities (SAUs) National seed corporation (NSC) and state seed corporation. (SSCs)

#### Foundation Seeds

F/S is produced from B/S either by Government agencies like NSC, SSCS or by private seed growers or by reputed seed companies (for their own varieties). This class of seed is not as pure as N/S or B/S. but has high genetic purity more than 98%. Besides the producing agency, the seed production is also monitored by the seed certification Agency of the state concerned.

#### Certified Seed

C/S is produced from the F/S by any of the agencies mentioned above or by a private seed grower or by any seed company. This production is also monitored by the seed certification agency to maintain the quality. Normally it is produced over large area to meet the demand of farmers. This is the class of seed which is normally used for commercial crop production.

**Truthfully labeled**

T/L Seed: produced mainly from the C/S by any of the above seed grower/agency. The basic difference between C/S and T/L seed is that there is no involvement of the seed certification agency in this seed production. However, the quality of this seed is maintained at par with the C/S in all respect. In the place of seed certification Agency the producer himself truthfully certify that the quality of seed is at par with the C/S. The Indian Minimum seed certification standards are applicable for only F/S, C/S and T/L and not for B/S or N/S.

**1.2.2 Characteristics of Quality Seed****a) High Physical Purity**

Physically pure, free from admixture like other crop seed, inert matter like broken stem, stubbles, soil particles etc.

**b) Good germination:**

High germination, atleast 90% and above or at par with the minimum standard prescribed in seed certification standard.

**c) Optimum moisture content** Should have optimum moisture content which will allow long time storage without deterioration.

**d) Uniformity** : Shape, Size, Colour and Individual grain weight should be same

**e) Free from diseases or pest damage:** Should not have any spot, lesion on the seed caused by any disease. Also should not carry any fungal fruiting boding like smut ball.

**f) Should express character true to type when grown**

**g) Should have vigour and growth potential when sown.**

**1.2.3 Seed Standard**

Under Indian Seed Act Minimum Seed Certification Standards called Indian Minimum Seed certification standards have been framed which is basis to maintain seed quality.

Minimum seed certification standards have 2 parts.

- a) Field standard
- b) Seed standard

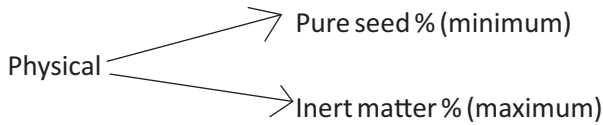
Field standard is applicable for seed crop in this field – general standards are for

- a) isolation: minimum distance to be maintained between a seed plot and other variety field.
- b) off types: Plants which are different from the variety which is grown for seed production.
- c) Other variety plants: plants of other varieties of same crop found in the seed plot.
- d) Diseased plants: presence of plants affected by diseases which deform the plant part. Ex: smut and ergot in sorghum and bajra.



Standards to be checked / followed during seed testing at the laboratory.

**Purity:**



Other crop seed (in number)	Maximum
Other variety seed which are distinguishable	Maximum
Total weed seed (in number)	Maximum
Germination %	Minimum
Moisture content	Maximum

Besides above, genetic purity standard have been prescribed for various crops / varieties.

Foundation – Seed 99%

(all the foundation seeds are inbreds or variety only, there is no hybrid in foundations)

Certified seed

a) variety	98%
b) Hybrids	96%

**Exercise**



1. Have you ever participated in the foundation or breeder seed production. Whether there is any special skill needed for F/S production?

Answer: .....

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.....

.....

2. Is there any state seed corporation in your state. Can you give the merit and demerit of SSCs over a private seed company?

Answer: .....

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3. How will you differentiate a seed from a grain?

Answer: .....

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## Tips



- **Differences between certified seed and truthful labelled seed**

Certified seed	Truthful labelled seed
Certification is voluntary	Truthful labelling is compulsory for notified kind of varieties
Applicable to notified kinds only	Applicable to both notified and released varieties
It should satisfy both minimum field and seed standards	Tested for physical purity and germination
Seed certification officer, seed inspectors can take samples for inspection	Seed inspectors alone can take samples for checking the seed quality.

Table 1.2.1 Differences between certified seed and truthful labelled seed

## Notes




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