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FACULTY OF AGRICULTURAL SCIENCES

AND ALLIED INDUSTRIES

DR. SUHEL MEHANDI

ASSISTANT PROFESSOR

GENRTICS & PLANT BREEDING

SST 221, PRINCIPLES OF SEED TECHNOLOGY

Introduction

The history of agricultural progress from the early days of man has been the history of seeds of new crops and crop varieties brought under cultivation. In the early days it was achieved through the cultivation of indigenous but useful plants and those taken through introductions. Later through the well known techniques of selection, hybridization, mutation, polyploidization and plant biotechnology the scientists made available many new and better varieties. However, to the farmer all this scientific research would be of little value unless he gets seeds, which are genetically pure, high germination percentage and vigour, high purity, sound health etc., when the farmers do not get seeds possessing these qualities the yields they obtain may not be as expected. The pace of progress in production therefore, will largely depend upon the speed with which we are able to multiply and market good quality seeds of high yielding varieties.

Definitions of Seed Technology

Cowan (1973) identified seed technology as "that discipline of study having to do with seed production, maintenance, quality and preservation".

Feistritzer (1975) defined seed technology as the methods through which the genetic and physical characteristics of seeds could be improved. It involves such activities as variety development, evaluation and release, seed production, processing, storage and certification.

Thus seed technology is essentially an inter disciplinary science which encompasses broad range of subjects. In its broadest sense," seed technology includes the development of superior crop plant varieties, their evaluation and release, seed production, seed processing, seed storage, seed testing, seed certification, seed quality control, seed marketing and distribution and research on seed physiology, seed production and seed handling based upon modern botanical and agricultural sciences".

In a narrow sense “seed technology comprises techniques of seed production, seed processing, seed storage, seed testing and certification, seed marketing and distribution and the related research on these aspects”.

Concept of seed technology

The distinction between seed and grain is vital, being of seminal importance to agriculture. A seed, strictly speaking, is an “embryo” a living organism embedded in the suppor ting or the food storage tissue. The seed pertains to material (seed, fruit or vegetatively propagating material) meant for saving for planting purposes, the essential function being the reproduction. The seed when scientifically produced (such as under seed certification) is distinctly superior in terms of seed quality, namely, the improved variety, varietal purity, freedom from admixtures of weeds and other crop seeds, seed health, high germination and vigour, seed treatment and safe moisture content etc. A grain on the other hand, includes cereals and pulses meant for human consumption. Differences between scientifically produced seed and the grain (used as seed).

S.No	(Scientifically produced) seed	Grain (used as seed)
1.	It is the result of well planned seed programme	It is the part of commercial produce saved for sowing or planting purposes
2.	It is the result of sound scientific knowledge, organized effort, and investment on processing, storage and marketing facilities.	No such knowledge or effort is required
3.	The pedigree of the seed is ensured. It can be related to the initial breeders seed	Its varietal purity is unknown
4.	During production, effort is made to rogue out off-types, diseased plants, objectionable weeds and other crop plants at appropriate stages of crop growth which ensures satisfactory seed purity and health.	No such effort is made. Hence, the purity and health status may be inferior
5.	The seed is scientifically processed, treated and packed and labeled with proper lot identity.	The grain used as seed may be manually cleaned. In some cases, prior to sowing it may also be treated. This

		is not labelled
6.	The seed is tested for planting quality namely, germination, purity, admixture of weed seeds and other crop seeds, seed health and seed moisture content.	Routine seed testing is not done.
7.	The seed quality is usually supervised by an agency not related with production (seed certification agency)	There is no quality control.
8.	The seed has to essentially meet the "quality standards". The quality is therefore well known. The labels, certification tags on the seed containers serves as quality marks.	No such standards apply here. The quality is non-descript and not known.

Role of seed technology:

Feistritzer (1975) outlined the following roles of improved seed.

1. Improved seed– a carrier of new technologies

The introduction of quality seeds of new varieties wisely combined with other inputs significantly increase yield levels. In India, the cultivation of high yielding varieties have helped to increase food production from 52 million tonnes to nearly 180 million tonnes over a period of 40 years.

2. Improved seed – a basic tool for secured food supply.

The successful implementation of the high yielding varieties programme in India has led to a remarkable increase in production and food imports from other counters have been brought down inspite of rapid increase in population.

3. Improved seed – the principal means to secure crop yields in less favourable areas of production.

The supply of god quality seeds of improved varieties suitable to these areas is one of the important contributions to secure higher crop yields.

4. Improved seed – a medium for rapid rehabilitation of agriculture in cases of natural disaster.

In case of floods and drought affected areas the Govt. will provide the improved seeds from national seed stocks to rehabilate the agricultural production of foods grains in the country

Goals of Seed Technology:

The major goal of seed technology is to increase agricultural production through the spread of good quality seeds of high yielding varieties. It aims at the following:

1. Rapid multiplication:

Increase in agricultural production through quickest possible spread of new varieties developed by the plant breeders. The time taken to make available the desired quantities of seeds of improved varieties to farmers should be considered as a measure of efficiency and adequacy in the development of seed technology in the country.

2. Timely supply:

The improved seeds of new varieties must be made available well in time, so that the planting schedule of farmer is not disturbed and they are able to use good seed for planting purposes.

3. Assured high quality of seeds:

This is necessary to obtain the expected dividends from the use of seeds of improved varieties.

4. Reasonable price:

The cost of high quality seed should be within reach of the average farmer.