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Session122: Seed Processing



Introduction

Seed lots received from the field are often at high moisture content and contain trash and other inert material, weed seeds, deteriorated and damaged seeds, off-size seeds, etc.

Seed processing is necessary in order to dry the seeds to safe moisture level; remove or reduce to the extent possible the various undesirable material, weed seeds, other crop seeds, deteriorated or damaged seeds

Causes of seed lot heterogeneity

Other than this the seed lot heterogeneity in its physical characters like size, colour, shape etc.

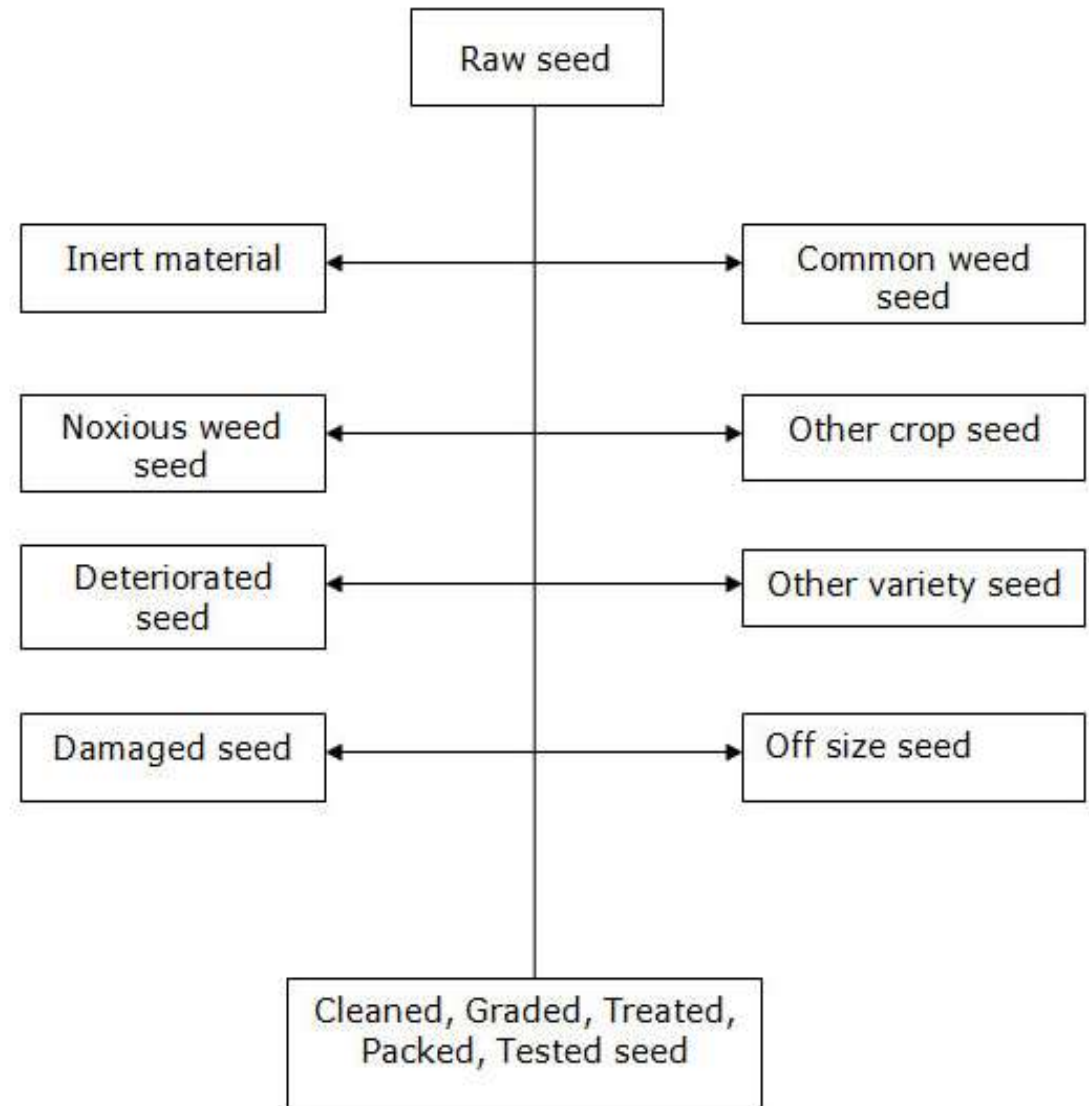
The seed lot is heterogeneous due to the following reasons:

The soil is heterogeneous and there is a lot of variability in the fertility status of the soil due to the availability of nutrients, physical, chemical and biological properties

Variability is introduced due to the position of seed set on the plant/fruit, time of pollination and fertilization over a period of time

Variability is created by biotic factors like pest and variability infestation

Variability is also due to the management practices like water, land preparation, leveling, staggered sowing, and uneven distribution of fertilizer and irrigation water, uneven plant protection sprays and uneven maturity at harvest



Seed Processing Plant Layout Planning

The following factors should be considered in planning and designing a seed processing plant:

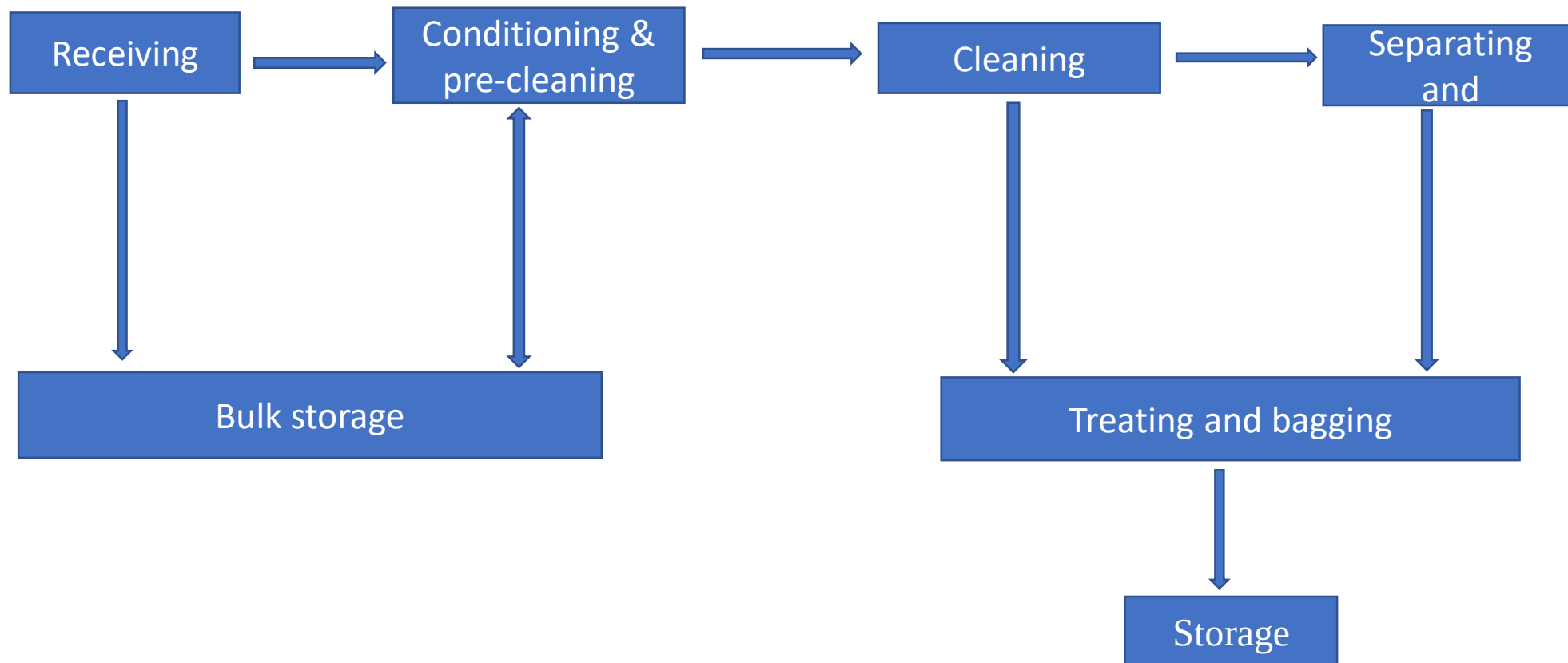
- Kinds of crop seeds to be handled and kinds of contaminating crop and weed seeds usually present in the seed lots
- Size of operation
- Whether drying facilities should be required
- Selection of suitable equipment
- Location of the plant
- Source of power for running machinery
- System of seed delivery to processing plant and
- Availability of labour

Requirements in seed processing

- ❖ There should be complete separation
- ❖ Minimum seed loss
- ❖ Upgrading should be possible for any particular quality
- ❖ Efficiency
- ❖ It should have only minimum requirement

Movement of seed in a processing plant

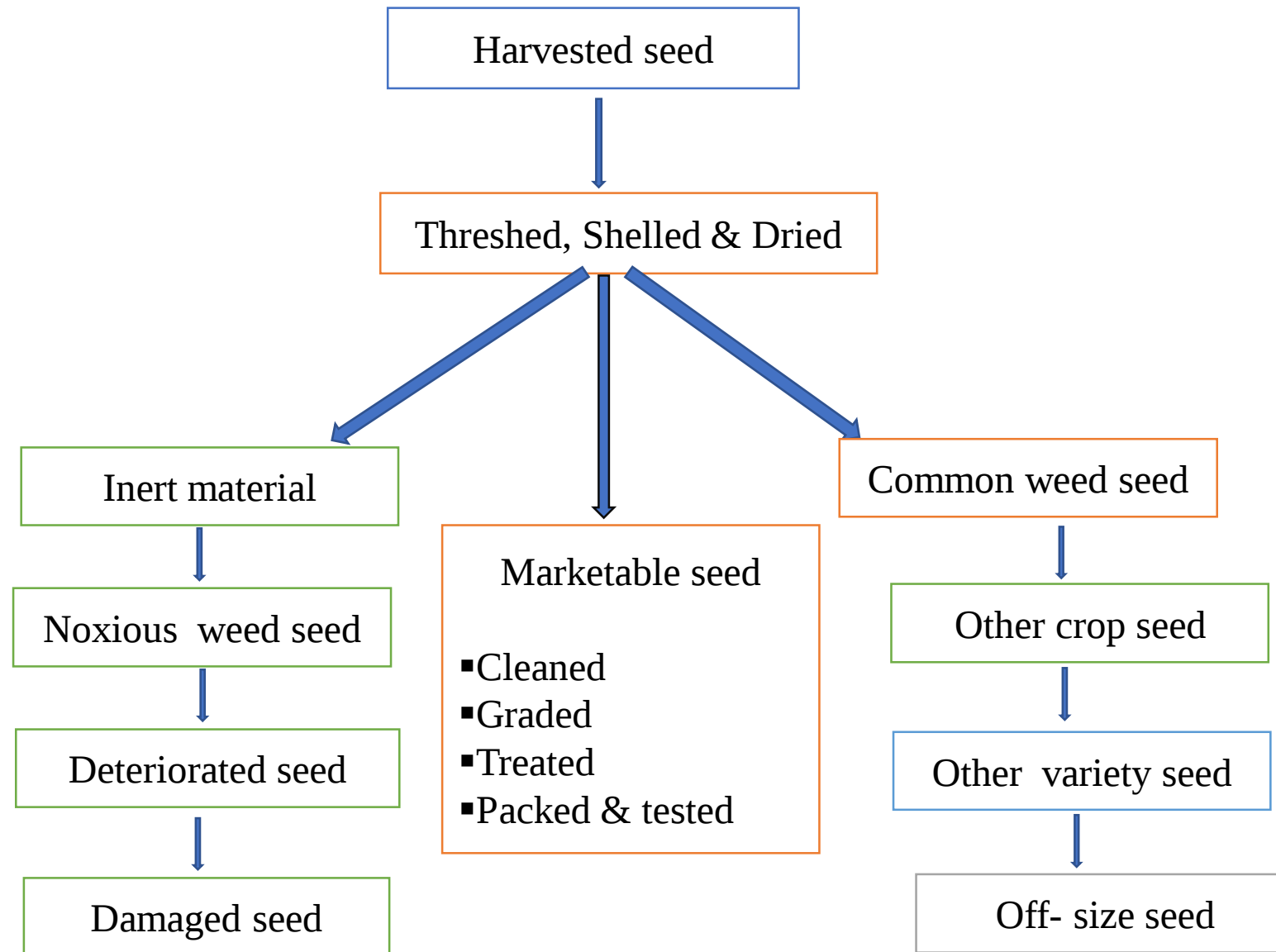
Handling of seed at the processing plant adheres to a definite path irrespective of crop for easy management of seed which is sensitive at each and every step of handling and ready to lose or gain its quality all through the steps



Physical characteristics used to separate seeds are

1. Size grader : Based on size it can be separated with air screen
2. Length : Disc or indented cylinder separator
3. Weight : Specific gravity separator
4. Shape : Spiral separator or draper separator for round and flat
5. Surface texture : Rough from smooth surface seed- dodder mill
6. Colour : Electronic colour separator
7. Electrical conductivity
Seed differing in their ability to conduct electrical charge can be separated with electronic separator
8. Affinity to liquid
The seed coat of seed will absorb water, oils etc., which provides a means of separating seed on the magnetic separator

The flow charts illustrating the types of materials removed from harvested produce during processing



Seed processing equipments

Sl No.	Processing equipments	Usage with reference to specific seed management
1	Thresher	To remove the seeds from the inflorescence especially in cereals
2	Maize sheller	To shell the seed from the cobs
3	Pulse thresher	To remove seed from the pods
4	Groundnut decorticator	To shell the kernel (seed from the pods
5	Debearder	To remove the awns form (Barley) the seed
6	echanical scarifier	To scarify the hard seed mechanically to improve the germination of seeds
7	Pebble mill	To remove webby hairs from grasses
8	Timothy bumper mill	To remove weed seed from timothy seed
9	Hammer mill	To remove the hook or appendages from the seeds (i.e. Stylosanthus)
10	Driers	To reduce the moisture content to lower or needed level for safe handling both for processing and for storage at the final stage
11	Cleaner cum grader	This homogenize the pre-cleaned seed based on size and is known as basic grading in seeds. The sieve sizes requirement vary with crop
12	Precleaner and aspirator	This remove the inert material and dust particles from seed and improve the grading efficiency

Seed processing equipments

Sl No.	Processing equipments	Usage with reference to specific seed management
13	Specific gravity separator	Improve the quality of graded seed further using its weight or specific gravity. Heavier seeds are good storers and expresses maximum field establishment
14	Indent cylinder	In lengthier seeds it maintains the size of seed (breadth and length). The broken / damaged are removed and good seeds are selected
15	Disc separator	It is for removal of weed seeds and to improve the general appearance of seed
16	Roll mill	To separate smooth seed from rough seed based on the surface texture especially the weed seed
17	Magnetic separator	Removal of weed seed from clovers, alfalfa, trefoils and vetch
18	Inclined draper	Separation of smooth or round seeds from rough, flat or elongated seeds
19	Electronic colour sorter	Separation of off-coloured seed
20	Electrostatic separator	Based on electrical properties removes Johnson grass from sesame seeds (Specific utility)
21	Spiral separator	Separation of seeds based on shape (eg.) separation of rape, vetch and soybean seed from wheat, oat or rye grass
22	Polishers	To improve the luster of seed
23	Picker belts	To remove undesirable ears / pods from shelled seeds (eg.) Groundnut, Corn
24	Vibratory separator	Removal of weed seed

Seed processing equipments

Sl No.	Processing equipments	Usage with reference to specific seed management
25	Seed treater	To treat the seed with fungicide and pesticide
26	Seed packing machine	To easier the work and to avoid human error of mixing
27	Conveyors / Elevators (Belt , Bucket)	Easier the transfer of seed from machine to machine and avoids the contamination of seed at various level.



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*Thank
you*

