PRINCIPLES OF SEED PROCESSING

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Processing involves three steps

STEP 1: PRE- CONDITIONING AND PRE CLEANING

(a) Pre conditioning:

Isolation of seed from plant parts with which it was harvested e.g. Shelling

Maize sheller

1. High capacity power operated shellers - bulk
2. Hand shellers – breeder or nucleus seed.

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(b) Pre cleaning:

Removal of external materials like trash, stones, clods which are either in larger size or lighter in weight. No pre cleaning is required for hand harvested and winnowed seeds

STEP 2: CLEANING

The second stage of cleaning is carried out with air blasts and vibrating screens and is applicable to all kinds of seeds. It is essentially the same as scalping but more refined. It is performed mostly by one machine known as air-screen cleaner.

Air-Screen cleaner cum grader

The air-screen machine is the basic cleaner in most seed processing plants.

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STEP 3 : CLEANING AND GRADING

To obtain quality seed, it is necessary to clean the seed obtained from the farm to get rid of:

- Inert materials
- weed seeds
- Other crop seeds
- other variety seeds
- damaged and deteriorated seed

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Different kinds of seeds can be separated when they differ in one or more physical characteristics. Physical characteristics normally used to separate seeds are:

- Size
- Shape
- Length
- Weight
- Colour
- surface texture
- affinity to liquids
- electrical conductivity

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Name of the Separator	Property followed	Uses
Gravity separator or Destoner	Density or specific gravity	Removal of badly damaged, deteriorated, insect damaged crop seed and stones from good seeds.

Name of the Separator	Property followed	Uses
Spiral separator	Shape or the degree of its ability to roll	Separation of damaged/flat and wrinkled seeds from smooth seeds. Separation of mustard, rape, soybean and peas from wheat, flax, oats, etc., and round seeds from flat seeds.

The separator, which classifies seed according to its shape and rolling ability, consists of sheet metal strips fitted around a central axis in the form of a spiral. The unit resembles an open screw conveyor standing in a vertical position. The seed is introduced at the top of the inner spiral. Round seeds roll faster down the incline than flat or irregularly shaped seeds, which tend to slide or tumble. The orbit of round seed increases with speed on its flight around the axis, until it rolls over the edge of the inner flight into the outer flight where it is collected separately. The slower moving seed does not build up enough speed to escape form the inner flight. Most spirals have multiple inner flights arranged one above the other to increase the capacity.

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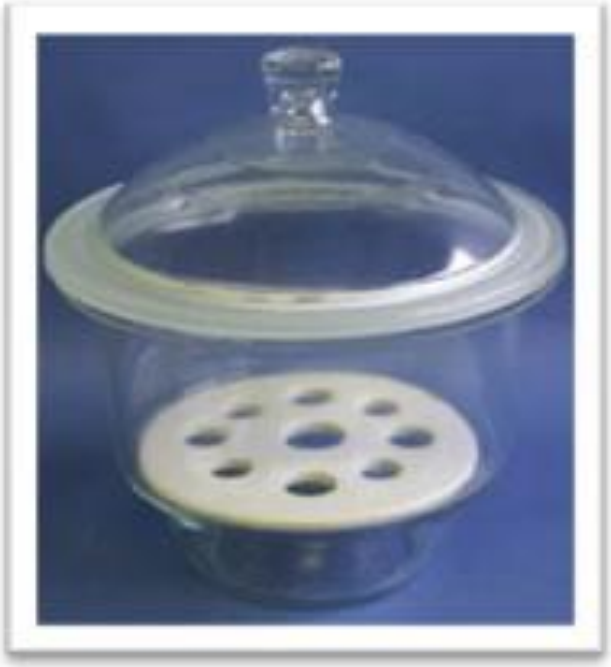
Name of the Separator	Property followed	Uses
Disk / Indented cylinder separator	Length	Dissimilar material like wheat, rye, mustard, barley from oats

This helps to separate seeds according to the length. The equipment consists of a slightly inclined horizontal rotating cylinder and a movable separating trough. The inside surface has small closely spaced hemispherical indentations. Small seeds are pressed into the indents by centrifugal force and can be removed. The larger seeds flows in the centre of the cylinder and is discharged by gravity.



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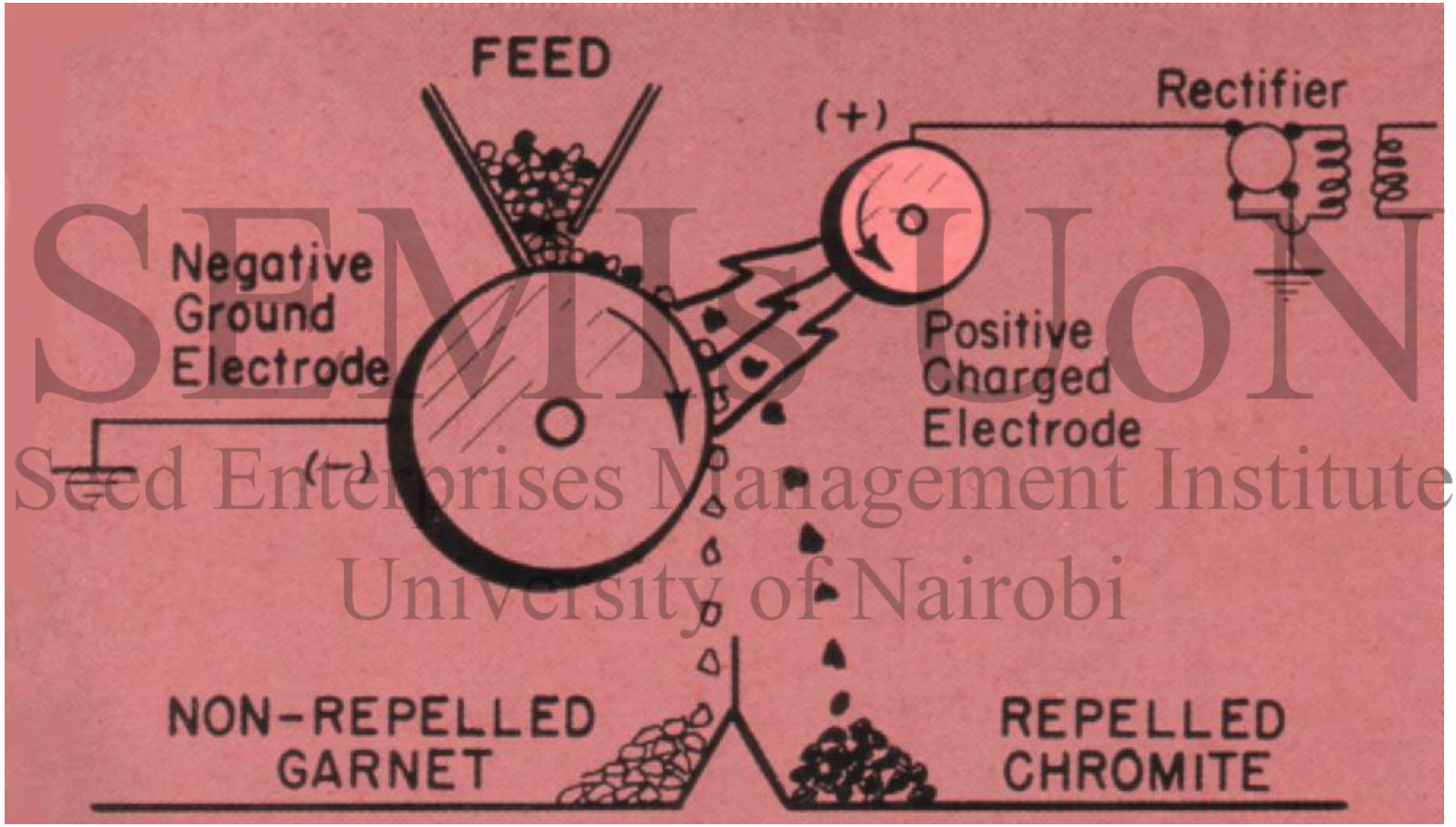
Name of the Separator	Property followed	Uses
Electrostatic separator	Electrical property	Johnson grass from sesame seed



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Name of the Separator	Property followed	Uses
Electronic colour sorters	Colour / brightness	Separation of off coloured seeds

The color sorter (right) uses an electronic eye that can pick up different colors according to the way the machine is adjusted. As seed falls down a shoot, it passes through the electric eye. If the color of the seed is different than the desired color, the electric eye will activate a sudden burst of air that pushes that seed into a reject bin while the rest of the seed passes through to another bin.

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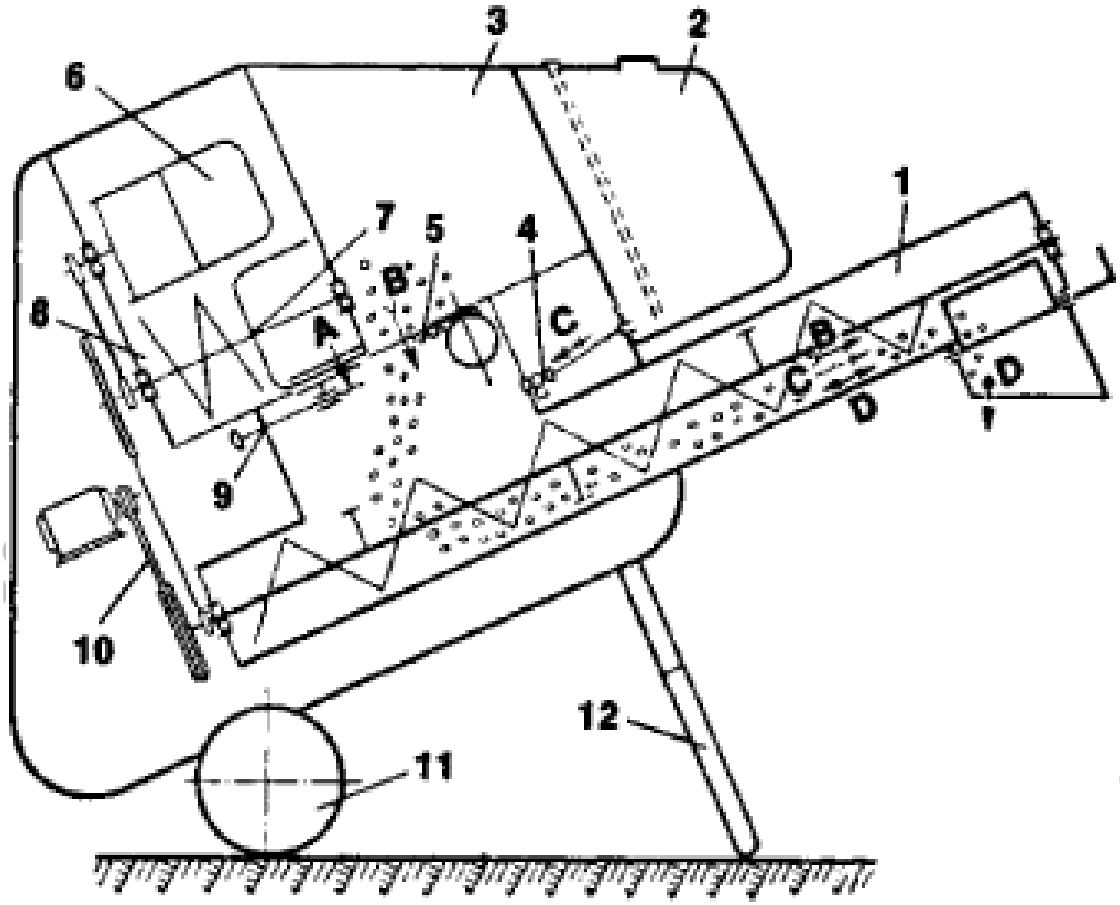
STEP 4: CLEANING AND GRADING



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STEP 4: PACKAGING

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