

SEED TREATMENT CHEMICALS
AND CALIBRATION CONCEPTS;
SEED TREATMENT HANDLING
AND APPLICATION EQUIPMENT
BY

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Objectives

- Explore seed treatment, equipment, chemical and treatment process

Questions

- Why is seed treatment important?
- What chemicals are used in treating the seeds?
- What practices should be observed in seed treatment?
- Importance of seed and chemical metering



Overview



- The application of seed treatment materials is a specialized operation and is usually the last step in seed processing.
- The equipment used to apply chemicals to seeds are classed as seed treaters and the design can be divided into Continuous Treating and Batch Treating.



Seed Treatment Chemicals

Common Seed Treatment Products:

- Fungicides
- Insecticides
- Nematicides
- Avicides
- Polymers
- Inoculants
- Colorants



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- Chemical Forms
 - Powder (Dust)
 - Slurry (Suspension)
 - Liquid film coating



Seed Treating Equipment –Safety

- Treatment materials are applied as dusts, slurries, or liquids.

Respirator

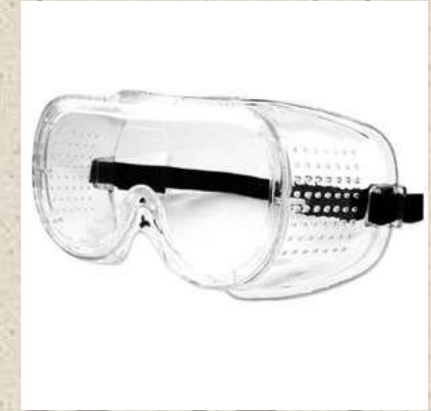
- Must be rated for chemical type in use
- Periodic fit test and employee physicals may be required for many applications



Seed Treating Equipment –Safety

Goggles –Splash & Dust Protection

- Standard safety glasses are NOT adequate



Face Shield –Eye & Face Protection

- Typically used in addition to goggles

Protective Gloves –Chemicals

- Minimum 14 mil Thickness
- DO NOT USE disposable Latex gloves



Seed Treating Equipment – Safety

Continuous Flow System:

- Apply treatment at a predefined rate to the continuous flow of seed.
- High capacity.
- Low to medium application rates.
- Single treatment chemical layer.



Batch System:

- It delivers a predetermined batch size into a mixing chamber.
- Low capacity.
- High chemical application rates.
- Flexible –multiple chemical layers.



Seed Treating Equipment –Elements

A closed treating system, batch or continuous, consist of five process elements:

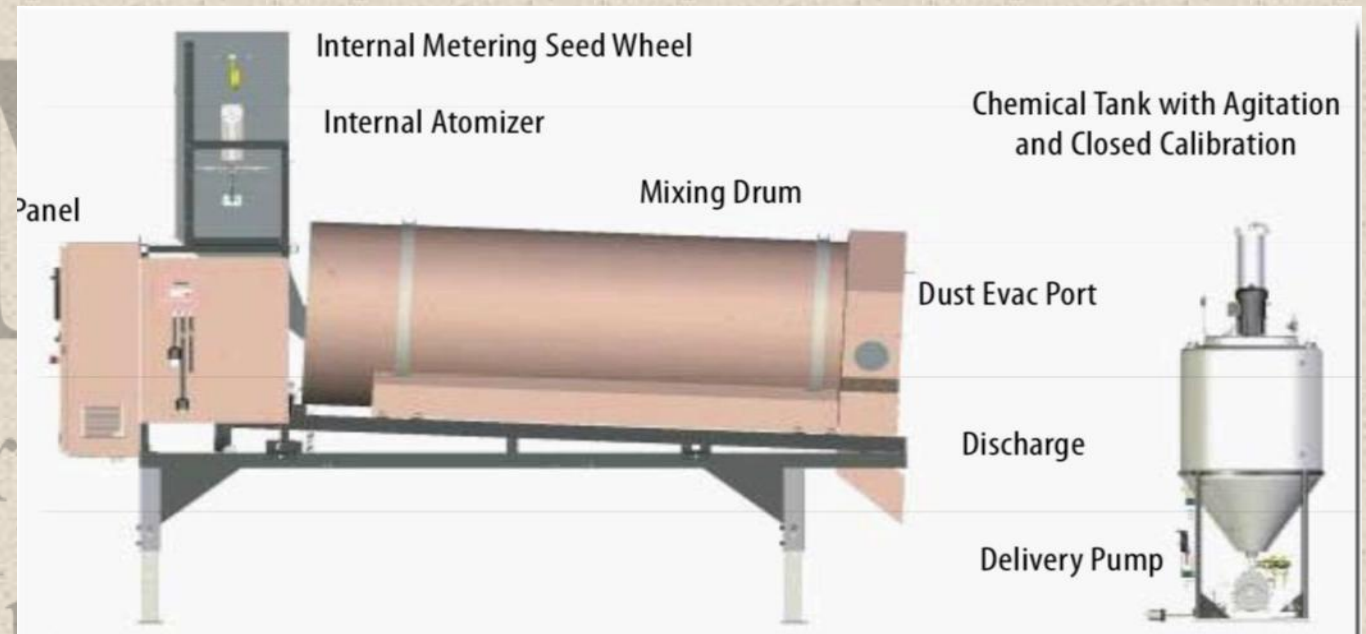
1. Storage and transfer
2. Delivery and metering of seed
3. Delivery and application of treatment
4. Mixing and blending
5. Dust containment



Seed Treating Equipment –Elements

Storage and transfer:

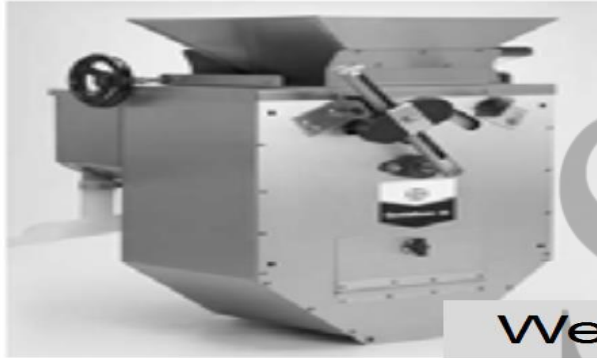
- Seed –Holding bin
- Chemical –Bulk container, transfer pump, and mixing tank



Seed Treating Equipment –Elements

Delivery and metering of seed:

Seed Metering Systems



Weight



Volume



Gravity Operated Weigh Pans with
Adjustable Counterweight Arm
Computerized Inline or Belt Scales
Volumetric Rotating Seed Wheel

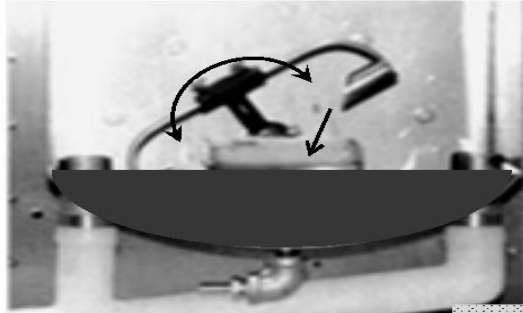
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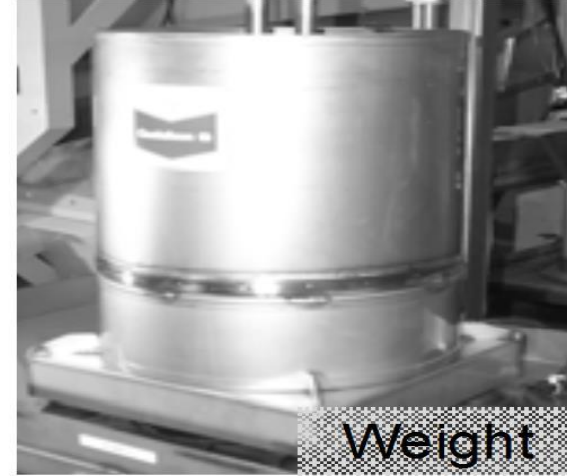
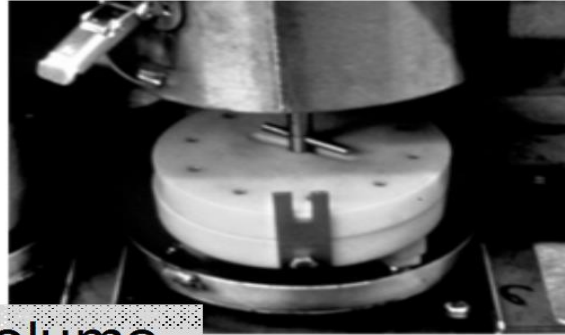
Seed Treating Equipment –Elements

Delivery and application of treatment:

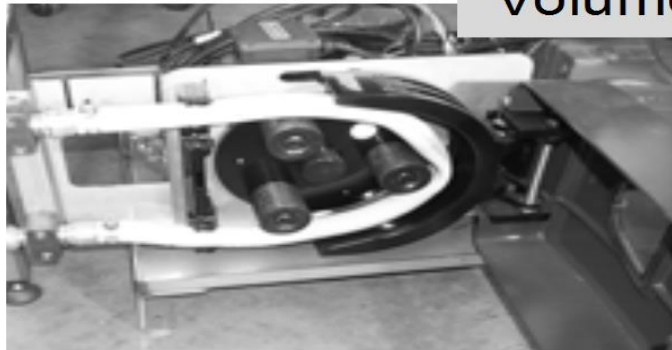
Chemical Metering Systems



Volume



Weight



Weigh Arm Chemical Cups
Volumetric Rotary Discs
Variable Speed Metering Pumps
"Loss in Weight" Batch Scales

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11

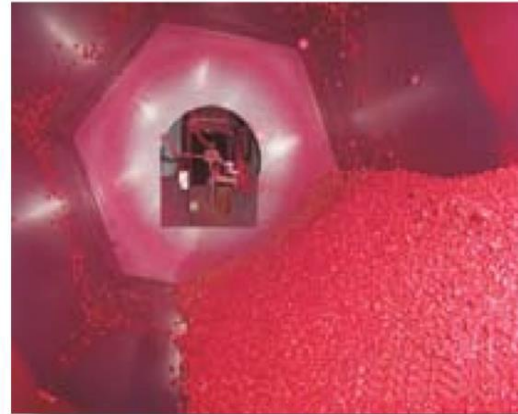


Seed Treating Equipment –Elements

- **Mixing and blending:**



Mixing Drum
(shown with treating head)



Mixing Drum
(view inside drum)



Mixing Bowl
(shown inside CBT Bowl)

- Primary Mixing: Direct application to seed
- Secondary Mixing: Seed contact transfer, blending action effects
- Drying and absorption: Ambient or artificial drying equipment



Seed Treating Equipment –Elements

Dust containment:



Dust Evacuation Port



Dust Evacuation System

Fan/Blower Motor

Dust Collection Bag

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SEED TREATING EQUIPMENT – CALIBRATION

Weigh Arm Calibration Example

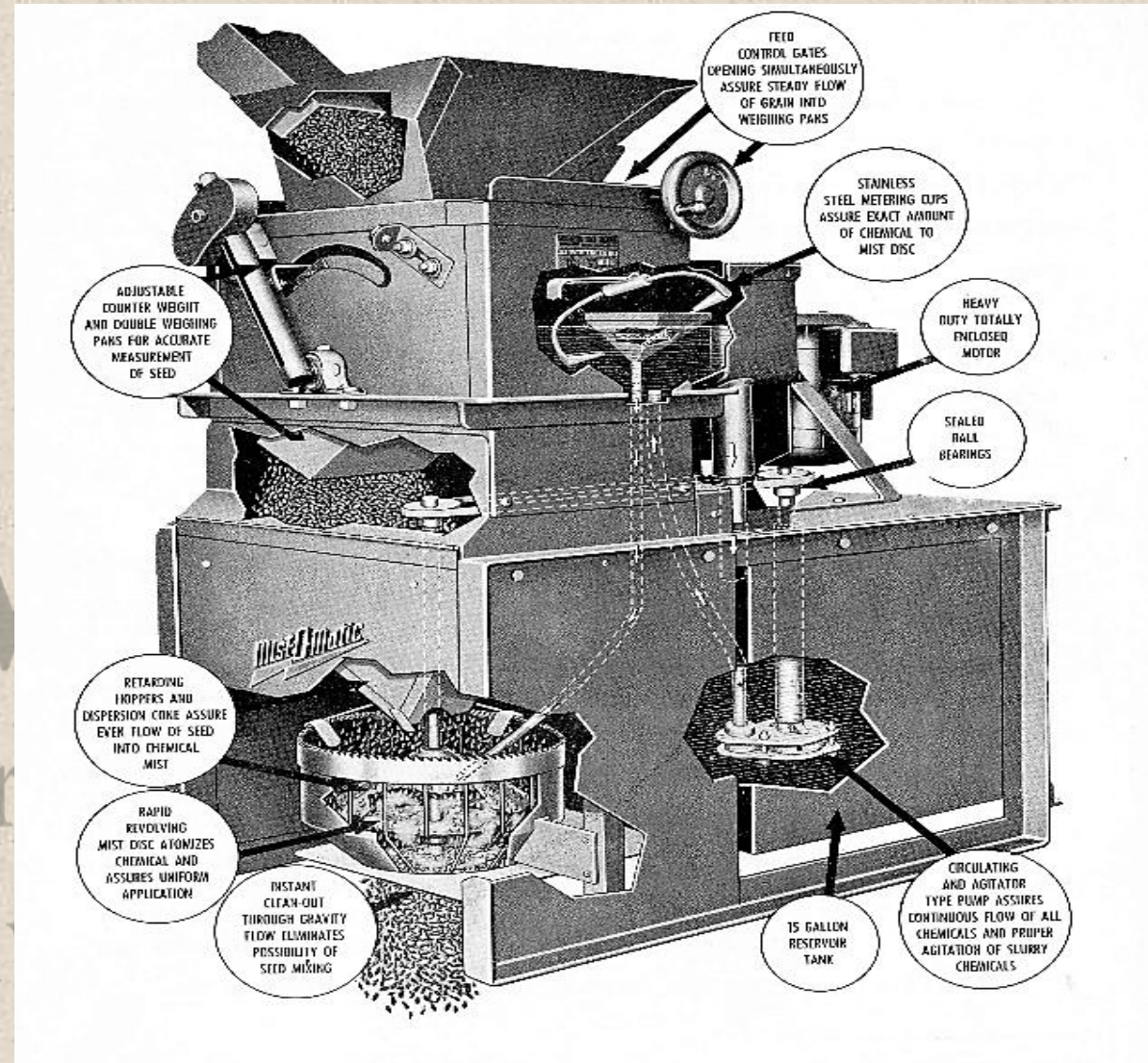
- Label Rate Range: 10-12 Fluid Oz/Cwt
- Converted Range: 296-355.2 CC/Cwt .
- Trip Count for 100 lbs = 20 Trips/Cwt

$$\text{Seed/trip: } \frac{100}{1\text{Cwt}} \times \frac{1\text{Cwt}}{20 \text{ Trip}} = \frac{5\text{lb}}{\text{Trip}}$$

$$\text{Cup Size: } \frac{296\text{cc}}{1\text{Cwt}} \times \frac{1\text{Cwt}}{20\text{Trip}} = \frac{14.8\text{cc}}{\text{trip}}$$

$$\frac{355.2 \text{ cc}}{1\text{Cwt}} \times \frac{1\text{Cwt}}{20 \text{ Trip}} = \frac{17.8\text{cc}}{\text{Trip}}$$

- Chemical Cup Size: 15 CC/Cup



Seed Treating Equipment – On Farm



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QUESTIONS

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