

# Agricultural Machinery

**Practical**

**2<sup>nd</sup> Stage**

**Lecturers:**

**Mr. Abdullah F. Younis**

**Mr. Alaa A. Sahib**

**2019 - 2020**

**Lecture 4**



# Seeding Process

The process of seed grain is important agricultural operation after tillage and the creation of the seedbed.



## The most important advantages of using mechanical seeding

- 1 - The distribution of seeds in the field regularly.
- 2 - Seeding the required quantity according the type of crop and thus lead to the provision of a large amount of seeds.
- 3 - Planting seeds on the lines of equal depths equal.
- 4 - Speed the process of planting seeds.
- 5 - Ensure cover seeds with soil after planting to prevent eaten by birds
- 6 - Chemical fertilizer can be distributed simultaneously with the operations of the seed when using seeder-fertilizer machine.
- 7 - Do some farming operations after plant growth.

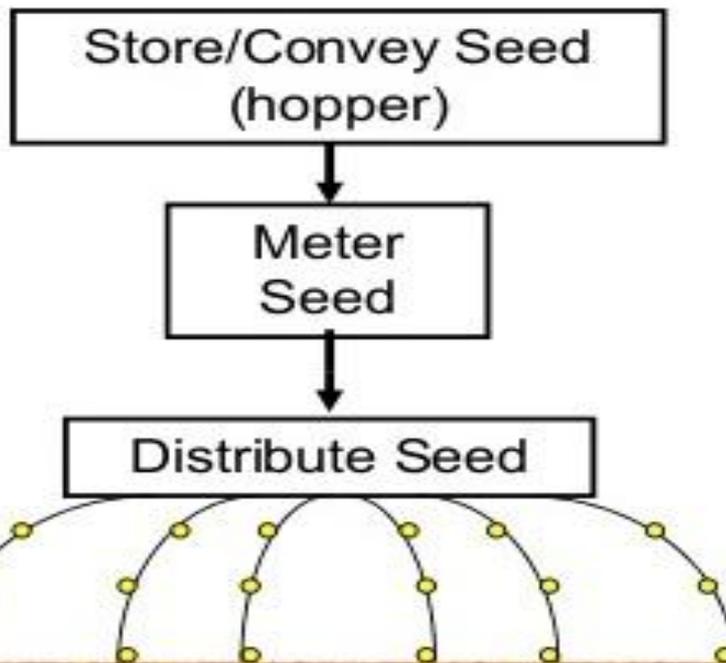


# Equipments for sowing and planting may be divided to:

## 1 . Broadcasters

### Broadcasting

#### Functional Processes



1. Convey seed
2. Meter seed
3. Distribute seed
4. Cover seed with second operation (depends on seed)



Model 1200C 3-yr. For Category 2 Tractors  
1200 lbs. capacity 30 cubic ft. 16 baskets

## 2 . Planters and Grain drills

These machines put a certain number of seeds in each hole and at equal distances between the seed and the other in-line or per class, and the distance between these lines can be made equal to other agricultural operations such as fertilization, hoes automatically.



# Setting a Planter Desired Planting Rate

## Example.

Suppose the desired cotton stand is 38,000 plants per acre. Assuming the number of surviving, healthy plants will be approximately 80 percent, the **planting rate (PR)** can be calculated by the following equation:

$$\mathbf{PR} = \frac{\text{Plants per acre desired}}{\text{Emergence percentage}} = \frac{38,000}{0.80} = 47,500 \text{ seed/acre}$$



# Seed Per Foot of Row Required for Planting

Convert the planting rate to reflect the row spacing in use. (In this example, a 38-inch row spacing is considered to be common in Arkansas cotton production.) An acre of land is equivalent to 43,560 square feet (ft<sup>2</sup>).

$$\frac{\text{Seed/foot of row}}{\text{row}} = \text{Planting rate} \times \frac{1 \text{ acre}}{\text{area in ft}^2} \times \frac{\text{row spacing}}{\text{row}} \times \frac{1 \text{ foot}}{\text{inches in a foot}}$$



$$\begin{aligned} \text{Seed/foot of row} &= \frac{47,500 \text{ seeds}}{\text{acre}} \times \frac{1 \text{ acre}}{43,560 \text{ ft}^2} \\ &\times \frac{38 \text{ inches}}{\text{row}} \times \frac{1 \text{ foot}}{12 \text{ inches}} = \frac{47,500 \times 38}{43,560 \times 12} \\ &= 3.45 \frac{\text{seeds}}{\text{foot of row}} \end{aligned}$$

**Note:**

Count seeds in a minimum of 10 feet of row and take the average to ensure the planting rate is as desired. Check a few rows.



# Amount of Seeds Required

To determine the total weight of seeds needed for planting the whole field, it is essential to know the approximate weight of seed required per acre. The weight of seed per acre required will be determined based on the desired plant population, seed germination and seed size. For many crops, size and germination rate vary considerably. Therefore, it would not be wise to depend on the same number of pounds per acre each year. The result could be thick or thin stands.



Most of the seed companies provide information on seeds per pound. If you want to confirm the seed size, count the number of seeds in one ounce of seed and multiply by 16 to get the average per pound. To get a better estimate, check several bags. To calculate the approximate pounds of seed per acre, use the following formula:

$$\text{Pounds of seed/acre} = \frac{\frac{\text{feet of a row}}{\text{acre}} \times \frac{\text{seed}}{\text{foot of a row}}}{\text{number of seeds/pound}}$$



## For example:

Feet of row per acre for a 38-inch row =

$$\frac{\text{area in ft}^2 \text{ in an acre}}{1} \times \frac{12 \text{ inches}}{1 \text{ foot}} \times \frac{1}{38 \text{ inches}}$$
$$= \frac{43,560 \times 12}{38} = 13,756$$

Desired seeds per foot of a row = 6

Seeds per pound = 3,200

$$\text{Seed requirement} = \frac{\frac{\text{feet of rows}}{\text{acre for 38-inch row}} \times \frac{\text{desired seeds}}{\text{foot of a row}}}{\text{seeds / pound}}$$

$$= \frac{13,756 \times 6}{3,200} = 25.8 \text{ pounds/acre}$$

