

## 1.3

## Crop establishment - Planting

### Planting

Planting is the most important phase in crop establishment. Mistakes made at this stage will certainly affect crop establishment and may lead to total failure of the crop. Planting involves placing the seed in the soil using manual or mechanical methods. It is important to have ideal soil conditions before planting is carried out.



### Questions a farmer should ask self before planting a crop

#### Management factors

##### Seed size and quality:

For a given grain crop, larger seeds produce more vigorous seedlings and improved crop establishment. A farmer should aim generally to grade and retain the larger grains as the best for seed.

##### Good seedbed preparation:

Good contact between seed and soil is critical during planting. This applies to both small and larger seeds. Good seed and soil contact is attained by placing some pressure after placing the seed on the soil and covering during planting.

##### Depth of planting

Depth of planting affects seed emergence. Deeper seed placement delays emergence as it takes more energy for the seedling to reach the surface. As a rule of thumb, the seeding depth should be about five times the size of the seed.

##### Row spacing

Closely spaced rows can result in poorer establishment due to competition for water or light from crowding of plants. The most appropriate row spacing is a compromise between crop yield and ease of inter-row operations like stubble handling, weeding, travel for spraying etc.

##### Soil Structure:

Soil structure plays a vital role in the establishment and growth of any crop. Problems with soil structure affects root development, fertility uptake and moisture retention. Soil compaction too will affect root development and soil water holding capacity by inhibiting water infiltration.

Planning the necessary operations well in advance of the planting season will increase chances of success. Some questions to be considered in advance of the planting season are such as:

- Has the soil been tested?
- Is the right seed available (type, & quality)?
- Is the right fertilizer or manure available?
- What is the best planting time (based on rainfall, soil type & availability of inputs)?
- What is the recommended seed rate for the type of crop to be planted?
- What types of weeds are anticipated?
- What planting and weed control technology is available or accessible?
- If chemical weed and pest-insect control methods are to be applied, are the right chemicals available?

##### Soil pH levels:

Acidic soil conditions (low pH levels) significantly affect the uptake of trace elements even if they are present in the soil. Acidity locks these minerals making them unavailable to the crops. Soil pH can be raised by liming soils. To ensure that the soil nutrient levels are maintained at the required level, it is strongly recommended that soil be tested on a regular basis.

##### Soil Fertilization:

Fertilizer use at the time of planting and later, during the crop development will aid crop establishment. An application of farmyard manure additional to fertilizer or alone helps to improve soil structure. It increases aeration and helps with moisture retention.

##### Weed Management:

Weeds are plants that establish themselves and grow where they are not wanted, and in competition with the crop. Weeds are one of the biggest obstacles to successful crop establishment. Careful choice of crop species, with consideration of any known weed problems, can help with weed control and aspects like herbicide selection and usage. If a drilled crop can establish quickly in a weed-free environment, it has a much greater chance of beating off any later pressure from late weed growth, pests and disease.

#### Environmental factors

##### Soil Temperature:

Low temperatures slow the rate of water absorption and reduce the production of proteins required for germination. Sustained low temperatures damage the seed embryo. The result is slow, 'staggered' germination, resulting in poor crop establishment

##### Soil water

A soil with soil moisture stress will have a germination rate that is lower and emergence slower. Light textured sands do not require as much time to wet up as finer-textured soils (loams and clays) but they retain less water and have a lower water-holding capacity. Management factors such as cultivation and stubble retention will affect the amount of water the soil can hold. The greater the soil disturbance, the higher the loss of soil water. Also, oxygen is essential to the germination process. In waterlogged soils, the soil oxygen is displaced by water and the seeds can't germinate because of the very low levels of oxygen.

- If the farmer will be using his own tools and equipment, are the tools and equipment to be used in good condition to carry out the anticipated operations?
- Has the equipment been calibrated?
- If the farmer will be using hired services, are there qualified service providers in the area?
- What is the condition of the field to be planted?