**Methods of planting**

After the land has been plowed and smoothed and pulverized it will need therefore to divide into strips, ridge or furrow according to crop type and irrigation system. Growing crops under rainfall conditions doesn’t need field dividing. While for some crops which need irrigation such as corn, sunflower, the field is divided into small basins, of a dimensions 2-12 m - 7-15 m in general, or 3 - 4 x 7 - 9 m in corn, but in wheat and clover 10 x 12 m or it could be divided into strips with width 15 - 20 m and length up to 200 m, depending on the land slope, soil texture, crop type and method of irrigation (after scattering, broadcasting, drilling the seeds).

**The Value of Good Varieties**

Before planting we must choose varieties. The varieties which used for seeding some point must be considered:

1- The varieties adaptation to soil and to climate.

2- The harvested product in marketing or in feeding.

3- High yield potential.

4 - Diseases and insect resistant.

**The Value of Good Seed**

 The use of seeds of good quality is of great importance in crop production. Not only must good seeds belong to good variety but they must have:

1- High germination percentage.

2- Big seed size and good development.

3- Purity of seed from other crop seed, normal and noxious weeds and from seed borne diseases

**Methods of sowing:**

Sowing

Is placing or planting the seeds in seedbeds which excellently prepared for certain purpose.

Seeds in agronomic means all plant parts that using for plant propagation which include: seeds, rhizomes, tubers bulbs… etc.

 Good quality seed is a prime essential to successful crop production, whereas poor seed is a serious farm hazard. Seeds germination and purity must be tested before sowing; seed must be free from weed seeds and should be free from disease pathogensor insects. Methods of sowing depend on:

1. Crops type.

2. Irrigation system.

3. The purpose of growing certain crops.

**Sowing methods:**

These methods divided according to:

1. Performance of seeding.

2. Soil humidity.

3. Irrigation system.

**1. Performance of seeding.**

**a. Broadcasting;**

 The seeds distributed by hand over the entire surface without any rows especially in small land in mountain regions. It needs experience to cover a fair amount of area in a day with good results. After that seeds are mixed with the soil by a light harrow such as spike tooth harrow. The **advantage** of broadcasting:

1. It is simple in action.
2. A large area can be covered in a short time.
3. It is suitable for grass and other crops for which seeds are very small and is necessary to get a thick growth.

**Dis advantage:**

The germination will not be uniform and the distribution will be irregular and large quantity of seeds is required.

**b. Drilling:**

The seed place in lines. The distance between the lines for cereals crops is about 15-20 cm and for legumes it will be a little more depending upon the type of crops, Soil and other conditions. Seeds placed in a uniform depth that will determine good germination and uniform growth. For dry farming, drilling is very suitable and in order to cover large areas in a short time, large drills are used. Under conditions where fertilizers have to be applied this operation can be carried out at the same time as sowing. In order to prevent fertilizer coming direct contact with the seed, it is placed in a separate line or at different depth from the seed.

**C - Furrow planting**

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The seed place in furrows. The distance between the furrows. for summer crops such as sunflower ,tobacco ,corn, cotton………etc .the distance between furrows is about 25 cm , 60-80 cm or 100cm .it is important for tuber crops and sugar beet . Seeds placed in a uniform depth planting, it must be on the 2/3 th  of the furrow, for optimum seedling.

***d. Transplanting methods:***

It refers to raising seedlings in specialized containers or confined field areas and then transferring them to the place when they will produce the harvested product.

It is practice used with the small-seeded vegetable crops, which are slow or difficult to germinate or require special germination conditions, it is also common in area where the growing season is short such as tobacco and rice

**There are three classes:**

1. Commonly transplanted group that usually survives the process well includes cabbage, tomato, lettuce خس, cauliflower and beets

**2**. An intermediate group contains celeryكرفس , eggplant, onions, and peppers.

3. Difficult to transplant and includes beans, corn, cucumbers and melons بطيخ.

Ease of root replacement correlated well with transplanting survival (Table 1). Suberization اضافة السوبرين and formation of cutin on the endodermal layer inhibited root formation and reduced water uptake by the roots remaining after transplanting .species that were difficult to transplant also had a greater amount of suberization .

Ease of transplanting decrease with age, and the differences between species become magnified.

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**2- According to soil humidity:**

1. Dry land sowing:

The dry seeds sown in dry land and then the water supplied after sowing directly .This method uses for most winter crops

e. g wheat, barley, flax, lentil, and some crops like cotton, corn and sugar cane.

b- Wetted land sowing:

In this method, the water provided to field after preparing dry seeds (or after 12-24 hours soaking) will sow with good covering without any irrigation for the time that the seeds are sprouted.

c- Planting with presence of water:

The field will divide to plots and covered of about 5 - 6 cm . with water supplying, and after decreasing level of covering water to 1 cm. or a little, the seeds spreading, this method mostly uses in rice or clover cultivation.

d- Nursery method: the same of transplanting method.

e – Quadrates method:

Seeds will sow in four directions equidistant places .thus the crops take a good conditions to sunlight, water, nourishment and little competition.

**3- According to irrigation system**

Irrigation is a method by which water is provided for plant growth when the natural rainfall is in adequate; it’s also aids in the control of soil an air temperature and to leach the soil of excess soluble salts.

The irrigation may be required before planting and at intervals up to flowering .one or two irrigations beyond flowering is desirable for many seed crops, in general the lighter soils need more frequent irrigation than heavy soils.

 **Date of time of sowing:**

Planting date for field crops is selected according to the suitability of temperature degrees for plant growing stages (at early and late stages), besides the suitability of photoperiod for final stage which is flowering period and fruit formation. It is found that temperature degrees have significant impact on determining of growth season length.

 **Cultural practices after sowing or post-sowing practices**;

**Replanting**

 It is defined as a re-planting of failing of seed to germinate under environmental conditions with the same cultivar seeds, and is performed when the proportion of failures is 30%, and if this proportion is higher than that, the field is replanted again. The emergence of seedlings above the soil surface depends upon the weather conditions; it may take 2-3 weeks in cold weather, 7-9 days in hot weather. The replanting of seedbeds should not be delayed so that the growth of plants over whole field be homogeneous. The replanting is conducted 2-3 weeks after planting. This failure could be due to one of these reasons, climatically factors, such as frost, excess or inadequate of water during sowing, old seeds, infection by insects and fungi, or deep sowing.

**Thinning**

This operation means to remove excess seedlings appeared in the field in order to maintain the proper crop density and to minimize the competition between plants on the essential requirements of water, mineral and sunlight, also to keep plants at uniform distance. This can be done by hand.

 **Some important notes should keep in consideration during thinning operation:**

1-It should be done as early as possible at least one time.

2- It must be leave the stronger seedlings in the hill or core

3- The week and infected seedlings must be removed

4- The seedlings must be pulled with their roots without injuring the remaining.

5- Thinning should be done before cultivation for better seedling.

**Cultivation:**

* This operation to be done after crops and weeds emergence in the field, it means disturbance the surface soil layer and placing soil around the roots and stem for supporting the young plant for better establishment, meantime to remove the weeds that compete the crops in addition to improve soil aeration and increase soil infiltration and keep soil moisture through closing the pores or slots in the surface soil layer.

**Weeding:**

**Intended to remove all undesirable plants that outgrowth with main crop .there are different methods uses for this purpose, as mentioned before.**