Crop Rotation

Definition:

Crop rotation can be defined as a regular recurrent succession of different crops on the same land through a considerable period of years according to a define plan. Rotations are most commonly of 3 to 7 years duration.

Benefits of crop rotations

There are many benefits to be obtained from a good rotations as follows:

1- control weeds, insects, and diseases.
2- May aid in maintain the supply of organic matter in the soil.
3- May aid in the maintenance of the soil nitrogen supply.
4- Prevents the accumulation of toxic substances developing from certain crop plants.
5- Often saves labor.
6- Keeps the land occupied a greater part of the time with crops.
7- Regulates the use of plant nutrients from the soil.
8- Systematizes farming.
9- Increase crop yields, and
10- Improve crop quality.

Essentials of crop rotation

The characteristics of a good rotations are summarized as follows:

1- The area of each crop should be nearly the same year after year unless there is a definite reason for changing it.
2- The rotation should provide enough forage crops for the animal lept.
3- The rotation should include one tilled crop for the elimination of weeds.

4- The rotation should keep the organic matter of the soil.
5- The rotation should provide as large an area of the most profitable cash crop as can be carried for.
6- The rotation should allow an appropriate sowing date for all crops.
7- The rotation most profitable crop should be given the best place in the rotation.

Planning the Rotation

In planning the crop rotation, the following steps should be considered:

1- Selection of rotations crops:
2- Determination of the area allotted to each crop
3- Determination of the rotation duration
4- Determination of the number of fields (sections) in the rotations
5- A square form is then drawn and divided into sections equal in their number to that of the rotation fields.
6- The selected crops are classified into winter and summer crops, and into leguminous and non leguminous crops.
7- The selected crops are then distributed in the rotation fields, the main crop should occupy the upper field (section), the second field is occupied with the crop which is likely to succeed the main crop, and the other fields are occupied with the other selected crops in the same order. The same crop sequence planned in the first year should be repeated in the successive years of the rotation.
8- Evaluation of the rotation to make sure that the plan ensures enough time for soil preparation, fulfils a good utilization for residual effect of legumes and maintain soil productivity.

Example:

Two- year cotton rotation in the Delta:

Make a plan for a crop rotation including: 50% cotton, 15% wheat, 10% flax, 13% clover, 12% field bean, 25% maize, and 25% cowpeas.

- Since **cotton** is the main crop, and it is an annual crop, thus the duration is equal to:

$$\textbf{Duration} = \frac{\text{Duration of main crop}}{\text{Percentage area of main crop}} = \frac{2}{½} = 2 \text{ years.}$$

- Number of fields (sections) = 2 (since cotton is an annual crop).
- The selected crops are classified according to the following order:

	Legumes	**non- legumes**
Winter crops:	clover, field bean	wheat, flax
Summer crops:	Cowpea	Cotton, maize

- Crops are distributed in the following design:

Area	**First year**	**Second year**
50 %	Clover (catch crop) 50 % then cotton 50 % (A)	(B)
50 %	Clover and beans , flax and wheat 13% 12% , 10% 15% then then maize , cowpea 25% , 25% (B)	(A)

Three-year cotton rotation in the Delta:

The following plan is an example for cotton rotation in areas where rice growing is not allowed.

Area	**1. year**	**2. year**	**3. year**
33⅓ %	Clover (catch crop then (A) cotton	(B)	(C)
33⅓ %	Wheat (and barley) then (B) maize	(C)	(A)
33⅓ %	Clover and beans then (c) maize	(A)	(B)

Advantages of third-year rotation:

1- The areas put under cereals (wheat and maize) and legumes (clover and beans) in the 3-year rotation are higher than those in the 2-year rotation.

2- The 2-year rotation needs higher irrigation water requirements, greater amounts of fertilizers, and more labor.

3- The 3-year rotation decrease the losses resulting from a low yield of cotton (due to a severe attack of cotton insects).

4- The yield of cotton in 3-year rotation increased by about 18- 22% over that in the 2-year rotation.

5- The 3-year rotation includes the three main crops needed by the farmers, namely, cotton as cash crop, clover as forage, and wheat and maize as important product for home consumption, in appropriate proportions.