Long Answer Type Questions

[5 marks]

Q. 1. Why is crop variety improvement important in cultivation? Describe the important factors for which variety improvement is done.

Ans. As we know, weather conditions, soil quality and availability of water are the main factors on which crop yield depends. As weather conditions like drought and flood situation are unpredictable, it is important to have varieties that can grow in adverse climatic conditions. In the same way, varieties that are tolerant to high soil salinity have also been developed. Some of the factors for which crop variety improvement is done are as follows:

(a) High Yield: To increase the productivity of the crop per acre.

(b) Improve Quality: Quality considerations of crop products vary from crop to crop. For instance, baking quality is important in wheat, protein quality in pulses oil quality in oilseeds and preserving quality in fruits and vegetables.

(c) Biotic and Abiotic Resistance: Crop production can fall due to biotic and abiotic stresses under different situations. Thus, varieties resistant to these stresses can improve crop improve crop production.

(d) Change in Maturity Duration: The shorter the duration of the crop from sowing to harvesting, more economical is the variety. It reduces the cost of crop production and allows the farmers to grow multiple crops in a year.

(e) Wider Adaptability: Developing varieties for wider adaptability helps in stabilising the crop production under different environmental conditions. Also, one variety can then be grown under different climatic conditions in different areas.

(f) Desirable Agronomic Characteristics: Height and profuse branching are desirable characteristics for fodder crops. Dwarfness is desired in cereals such that fewer nutrients are consumed by these crops. Thus, developing varieties of desired agronomic characters also help in higher yield.

Q. 2. Describe the main irrigation systems that are adopted in India.

Ans. Different kinds of irrigation systems are adopted to supply water to agricultural lands depending on the kinds of water resources available. These include wells, canals, rivers and tanks.

(a) Wells: They are of two types-dug wells and tube wells. In dug wells, water is collected from water bearing strata while in tube wells water is tapped from the deeper strata. From these wells, water is lifted by pumps for irrigation.
(b) Canals: Canal system is usually an elaborate and extensive irrigation system.

Canals receive water from one or more reservoirs or from rivers. The main canal is divided into branch canals having further distributaries to irrigate fields.

(c) River lift systems: In this system, water is directly drawn from the rivers for supplementing irrigation in areas lying lose to rivers. This system is used in areas where canal flow is insufficient or irregular due to inadequate reservoir release.

(d) Tanks: Tanks are small storage reservoirs, which intercept and store the run-off of smaller catchment areas.

Apart from the above systems, some new initiatives have been undertaken for increasing the water available for agriculture. These include rainwater harvesting system and watershed management system. This involves building small check-dams which lead to an increase in groundwater levels. These check-dams stop the rainwater from flowing away and also reduce soil erosion.

Q. 3. Enlist the criteria for the selection of crops for mixed cropping.

Ans. Mixed cropping is employed to minimise risk and as an insurance against crop failure due to abnormal weather conditions. The main criteria's for selection of the crops for mixed cropping are as follows:

(a) Duration of Crops: One of the crops should be a long duration and other should be a short duration crop.

(b) Growth Habit: One of the crops should be growing tall and the other should be growing short. The component crops should have different canopy (i. e., the structure of leaves, stem and flowers found above the ground).

(c) Nutrient Demand: One of the component crops should require lesser nutrients than the other crop.

(d) Root Pattern: One of the crop should be deep-rooted while the other should be shallow-rooted.

(e) Water Requirement: One of the component crops should require lesser water than the other.

Q. 4. What are weeds? Enlist the methods employed to control weeds.

Or

Discuss various methods for weed control.

Ans. The unwanted plants in a cultivated field are called weeds. They compete for food, space and light with the main crop plants. They germinate and grow faster, and thus effect the quality and yield of the crop. For these reasons, weed plants need to be removed from the cultivated field in early stage of crop. The methods employed for weed control are as follows:

(a) Mechanical Method: The weed plants are removed from the field either manually or with the help of agricultural implements like uprooting or hand hoeing or weeding with khurpi, ploughing, etc.

(b) Cultural Method: This method includes:

(i) Proper seed bed preparation

(ii) Timely sowing of crops

(iii) Intercropping

(iv) Crop rotation

(c) Chemical Methods: By spraying chemicals that do not harm crop plants but destroy only the weed plants, the latter can be controlled. These chemicals are called weedicides, e.g., 2, 4-D and atrazine.

(d) Biological Method: As we know, some insects feed an particular weeds. Thus, we use these insects as biological weed-controlling agents like the use of cochineal insect to control opuntia weed and the use of the grass carp fish to control aquatic weeds.

Q. 5. Why are improved poultry breeds developed? Describe the desirable traits for which new varieties are developed.

Ans. Poultry farming is undertaken to raise domestic fowl for egg production and chicken meat. For this, improved poultry breeds are developed and farmed to produce layers for eggs and broilers for meat. The cross-breeding programmes between Indian (indigenous like Aseel) and foreign (exotic like Leghorn) breeds for variety improvement are focused on developing new varieties for the following desirable traits:

(a) The number and quality of chicks.

(b) Dwarf broiler parent for commercial chick production.

(c) Tolerance to high temperature.

(d) Low maintenance requirements.

(e) Reduction in the size of the egg-laying bird possessing the ability to utilise more fibrous and economical diet that are formulated using agricultural by-products.

Q. 6. Describe composite fish culture system. What is the major problem in fish farming? How is it overcome?

Ans. By adopting composite fish culture systems, intensive fish farming can be done. Both local and imported fish species are used in such systems. In such a system, a combination of five or six fish species is used in a single fish pond. These species are selected in such a way that they have different types of food habits and don't compete

for food among themselves. As a result, the food available in all the parts of the pond is used.

For example:

Catlas are surface feeders, Rohus feed in the middle-zone of the pond, Mrigals and Common Carps are bottom feeders, and Grass Carps feed on the weeds. Together these species can use all the food in the pond without competing with each other. This naturally increases the fish yield from the pond.

One problem with such a composite fish culture is that many of these fishes breed only during monsoon. Even if fish seed is collected from the wild, it can be mixed with that of other species as well. So a major problem in fish farming is the lack of availability of good quality seed. To overcome this problem, now some ways have been worked out to breed these fish in ponds using hormonal stimulation. This has ensured the supply of pure fish seed in desired quantities.

Q. 7. Differentiate between fertilisers and manures.

Ans. Differences between fertilisers and manures:

Fertilisers	Manures
1. They are inorganic substances which are manufactured in factories.	**1.** Manure is an organic substance that is obtained from decomposition of vegetable and animal waste.
2. Microbes are not needed for their formation.	**2.** Microbes degrade the organic substances to form manure.
3. Easy to transport, store and apply to crops.	**3.** It is difficult to transport, store and apply manure to crops.
4. They do not restore soil texture.	**4.** They restore soil texture.
5. They do not help in retention of water.	**5.** They help in the retention of water.

Q.8. How is intercropping different from mixed cropping?

Ans.

Mixed cropping	Intercropping
1. There is no definite pattern of rows.	1. Crops are grown in definite pattern of rows like 1: 1, 1: 2 or 1: 3.
2. It is undertaken to reduce the chances of crop failure.	2. It is undertaken to enhance the production of crops per unit area.
3. Mixed cropping cannot be done separately for crops.	3. In intercropping crops can be harvested as well as threshed separately.
4. Seeds are mixed up before sowing.	4. Seeds are not mixed before sowing.
5. Application of fertilisers and spraying of pesticides for separate crops is not possible.	5. As per the need of the individual crop, fertilisers as well as pesticides can be applied easily.