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CLASS 9 SCIENCE NOTES

Improvement in Food Resources



Key
NOTES

Important
QUESTIONS

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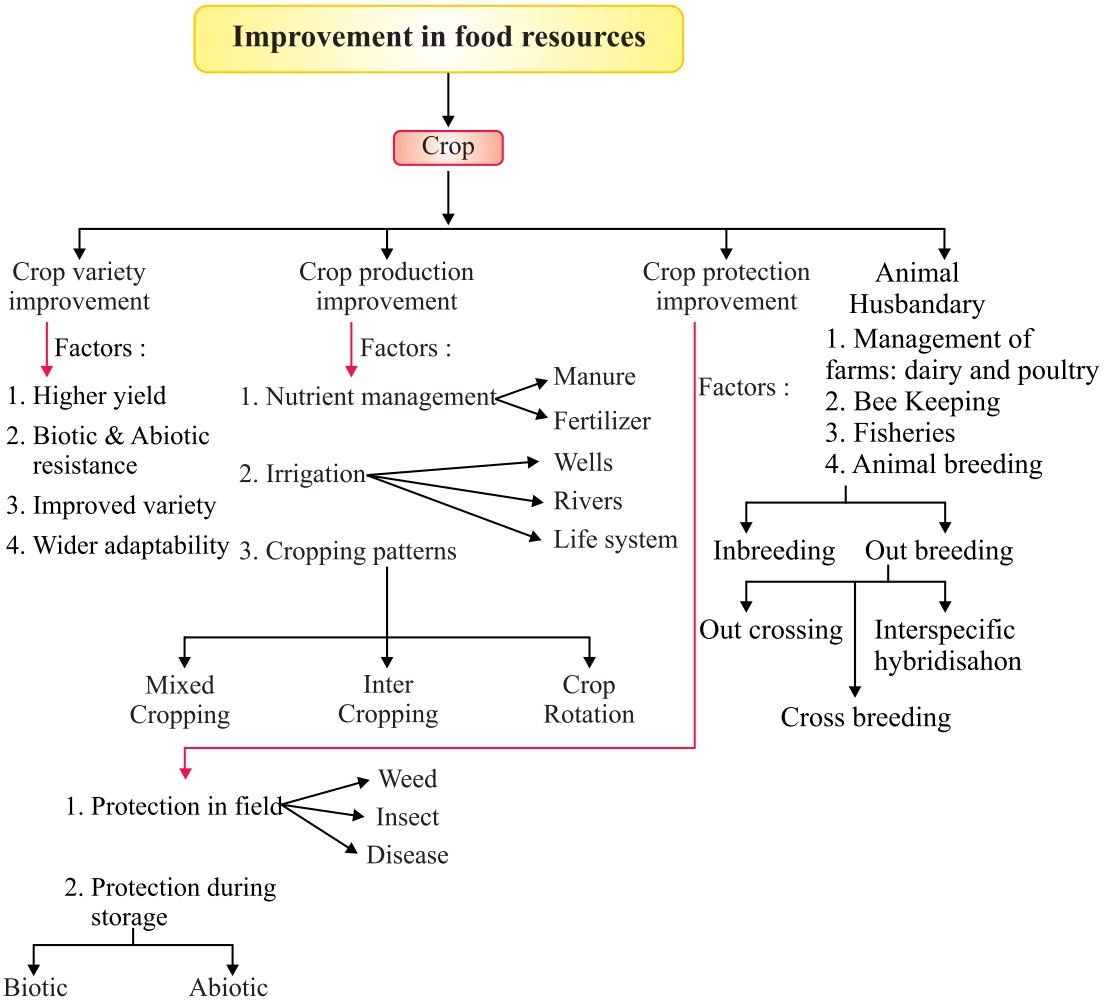




Chapter - 15

Improvement In Food Resources

CONCEPT MAPPING



Green Revolution

Green revolution is a programme introduced in many countries to increase food production by use of modern technology, proper irrigation, improved seeds etc.

White Revolution

White revolution is a programme in India to increase production of milk in India. This programme made India self-sufficient in production of milk.



Improvement in Crop Yields

Types of Crops :

(a) Cereals : They include crops like wheat, rice, maize, barley etc. They provide us carbohydrates.

(b) Seeds : Not all seeds of plants are edible like seeds of apple or cherries. Edible seeds include cereals, pulses, oil seeds and nuts. They provide us fats.

(c) Pulses : They include legumes such as gram, pea, black gram, green gram, lentil. They provide us proteins.

(d) Vegetables, spices and fruits : They provide us vitamins & minerals.

They include apple, mango, cherry, banana, water-melon etc.
Vegetables like spinach, leafy vegetables, carrot etc.
Spices like chilly, black pepper, cinnamon, fennel etc.

(e) Fodder crops- They provide green fodder to the cattle eg - oats, sorghum etc.



Crop Season :

Different crops require different conditions (temperature, moisture, etc.), different photo-periods (duration of sunlight) for their growth and completing life cycle.

The two types of crops seasons are :



(a) Kharif Season : These crops grow during rainy season (June to October). They are also called summer season crops E.g. of Kharif crops are black gram, green gram, pigeon pea, rice, paddy, soyabean.

(b) Rabi Season : These crops are grown during November to April. Rabi crops are known as winter crops. E.g., wheat, gram, peas, mustard, linseed etc.

Approaches which enhance the crop yield are as following :

(i) Crop variety improvement

(ii) Crop production improvement

(iii) Crop protection improvement

(A) Crop Variety Improvement : Factors by which variety improvement can be done are :

- Good and healthy seeds
- Hybridization : It is the process of crossing between two or more genetically dissimilar plants to produce a new variety with good properties of both the crops.

Properties to be possessed by improved seeds

Or

Factors for which variety improvement in crops is done

(a) Higher yield : To increase the productivity of the crop per acre.

(b) Improved quality : Quality of crop products vary from crop to crop.

(c) Biotic & Abiotic resistances : Crop production reduces due to biotic and abiotic factors. Varieties resistant to these factors can improve crop production.

(d) Wider adaptability : Crops which can grow in different conditions, will help in setting high production.

(e) Desired agronomic traits : Crops which contain desired agronomic traits (height, branching, leafs), sets high production.

(B) Crop Production Improvement : It involves different practices carried out by farmers to achieve higher standards of crop production. They are :



(a) Nutrient management
(b) Irrigation
(c) Cropping patterns

(a) Nutrient Management : Like other organisms, plants also require some elements for their growth. These elements are called nutrients.

Sources	Nutrients
Air	Carbon, oxygen
Water	Hydrogen, oxygen
Soil	(i) Macro nutrients : Nitrogen – required by plants in large amount, phosphorus, potassium, calcium, magnesium, sulphure.

(ii) Micro nutrients : Iron, Mn – required in small amount, boron, Zn, copper, molybdenum, chlorine.

Manure and Fertilizers

To increase the yield, the soil can be enriched by supplying nutrients in the form of manure and fertilizers.

Manure :

- It is a source of organic matter.
- It supplies small quantities of nutrients to the soil.
- It is prepared by the decomposition of animal excreta and plant waste.

Various forms of Manures :

(A) Compost : The process in which animal excreta (like cow dung), kitchen waste, plant remains, waste food, sewage waste etc. are decomposed in pits is known as composting.

(B) Vermicompost : Compost prepared by using earthworms to hasten the process of decomposition of plants and animals refuse is called vermicompost. Here, an earthworm is physically aerator, crusher and mixer, chemically a degrader and biologically a stimulator of decomposition.

(C) Green manure : Some plants like sunn hemp, guar etc. are grown and after sometime mulched by ploughing in the field. These green plants turn into green manures. They are rich in nitrogen and phosphorus.

Fertilizers :

Fertilizers are prepared in factories. They are made up of chemical substances. They have large amount of nutrients like nitrogen, phosphorus and potassium.

Fertilizers are easily absorbed by the plants since they are soluble in water. It is costly.

Difference between Manures and Fertilizers

Manures	Fertilizers
1. These are organic substances.	1. These are inorganic substances.
2. These are made up of natural substances (decomposition of plant and animal waste).	2. These are made of chemical substances.
3. These have less amount of nutrient.	3. These have large amount of nutrients.

4. These are cheap and are prepared in rural homes or fields.	4. These are costly and are prepared in factories.
5. Manures are slowly absorbed by the plants since they are insoluble in water.	5. Fertilizers are easily absorbed by the plants since they are soluble in water.
6. It is difficult to store and transport.	6. Their storage and transportation is easy.

(b) Irrigation : The process of supplying water to the crop plants is called irrigation.



Methods of Irrigation :

(i) Wells : These are of two types :

Dug wells : In dug wells, water is collected by bullock-operated devices or by pumps.

Tube wells : It makes very deep underground water available for irrigation. Motor pump is used to lift water.

(ii) Canals : These get water from large rivers.

(iii) River lift system : In this system, water is directly taken from rivers through pumps. This system is useful for irrigation in areas close to river.

(iv) Tanks : These are small storage reservoirs.

(v) Rain water harvesting : Rain water harvesting is a accumulation of water in tanks for later use. This also prevents soil erosion.



(c) Crop Patterns : Different patterns are used to maximize the production from crop field. They are :

(i) Mixed cropping

(ii) Inter cropping

(iii) Crop rotation

(i) Mixed cropping : Growing two or more than two crops together on the same piece of land is called mixed cropping. *E.g.,* wheat and gram, wheat and mustard, groundnut and sunflower. This is generally done to minimize the risk of total crop faliure due to abnormal weather conditions. Fertility is also seen to be increased.

(ii) Inter cropping : Two or more crops are grown on the same field in a definite pattern. Few rows of one followed by few rows of the other. *E.g.,* Soyabean + maize, pearl millet (Bajra) + Cow pea (lobia). It makes better use of natural resources of sunlight, land and water end also arrest soil erosion effectively

(iii) Crop rotation : Crop rotation is policy of growing different crops one after another on the same field.

- If some crop is grown again and again on the same field, same nutrients are extracted from soil again and again. So we should choose different crops so that all nutrients of soil are used.
- **Advantages :**
  (1) Soil fertility is maintained.
  (2) It controls pests and weeds.
  (3) Several crops can be grown in succession with only one soil preparation.

(C) Crop Protection Improvement

To protect crops against diseases causing organisms and other harming factors is called crop protection. Following methods are used to control these problems :

(a) Pest control during growth

(b) Storage of grains

(a) Pest control during growth : Pest is any destructive organism which can destroy or harm crops or products obtained from them. Pests are of many types :

(i) Weeds : Unwanted plants in the cultivated field *e.g.,* xanthium.

(ii) Insects : Insects can harm plants in following ways :

- They cut the root, stem and leaf.
- They suck the cell sap from various parts of the plant.

(iii) **Pathogens :** Organisms such as bacteria, fungi and viruses which cause diseases in plants are called pathogens. They are transmitted through air, water, soil.

(b) **Storage of grains :** For getting seasonal foods throughout the year, they are stored in safe storage. But during storage of grains, they can be destroyed and wasted by various means.

(i) **Biotic problem :** Due to living organisms like insects, birds, mites, bacteria, fungi.

(ii) **Abiotic problem :** Due to non-living factors such as moisture, inappropriate temperature etc.

These factors affect quality in form of degradation, loss in weight, change in colour, poor germinability.

Organic Farming

Using fertilizers and pesticides has its own disadvantages. They cause pollution, damage soil fertility in long run. Grains, fruits, vegetables obtained may contain harmful chemical in small amount.

Organic farming is a farming system with no or very little use of chemicals like fertilizers and pesticides.

Different ways to protect food grains before they are stored for future use :

(a) **Drying :** The food grains should be properly dried in the sun.

(b) **Maintenance of hygiene :** The grains must not contain insects. The godowns should be cleaned well. The cracks in the roof and on the walls and floor should be sealed completely.

(c) **Fumigation :** Godowns and stores should be properly sprayed with fumigants. Specially, the seeds should be treated with insecticides and fungicides.

(d) **Storage devices :** Cleaned and dried grains should be stored in gunny bags or other proper bags. Airtight, moisture-resistant and temperature-resistant storage devices have been developed by various organizations. These should be used.

ANIMAL HUSBANDRY

Animal husbandry is a scientific management of domestic animals in an efficient manner to obtain food and other useful products from them.

Cattle farming : Purpose of cattle farming is :

(a) For getting milk

(b) Ploughing fields

(c) Bull cart for transportation

Types of cattle :

- Cow (Bos indicus)
- Buffalo (Bubalus)

Milch animals : These includes milk producing animals (female cattle).

Draught animals : Those animals which do not produce milk and are used for agricultural work.

Lactation period : The period of milk production between birth of a young one and the next pregnancy is called lactation period.

Care of Cattle

(1) Cleanliness

- Roofed shelter with good ventilation for protection from rain, heat and cold.
- Regular brushing of skin of cattle.
- Sloping floor for shelter for avoiding water-logging.

(2) Food

- Roughage mainly containing fibre
- Concentrates containing proteins
- Food containing micronutrients (vitamins and minerals) for enhanced milk production

Diseases : Diseases can cause death and reduce milk production.

- Parasites are small organisms living inside or outside the body of another organism (host). They derive food from the body of host.
- External parasites on skin of cattle cause skin diseases.
- Internal parasites like worms cause stomach and intestine problems and

flukes cause liver problems.

- Bacteria, virus cause infectious diseases (diseases that can be easily transmitted from one to another).

Poultry Farming : Poultry farming is done for eggs and meat. They both provide protein to our diet.




Broilers : Birds grown for obtaining meat are called broilers. They can be used after 6-8 weeks from their birth.

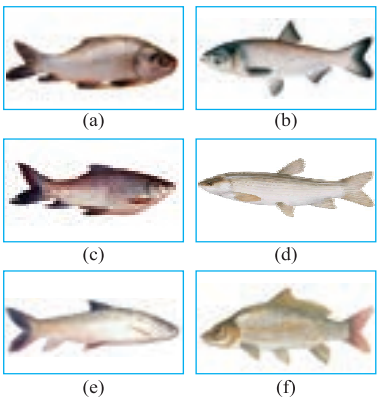
Layers : Birds grown for obtaining eggs are called layers. They can be used after 20 weeks when sexual maturity has been attempted to lay eggs.

Most of the broilers and layers are cross-bred.

Breeding is done to enhance following properties in hens :

- More and better quality chicks.
- Low maintenance.
- Breeding is done to produce dwarf broilers (meat-giving birds). Feeding cost is the biggest expense in poultry farms. Dwarf broilers need less food and can reduce cost by 30%. Also, they can tolerate more heat.

Fish Production :



(a) Catla (b) Silver carp (c) Rohu (d) Grass carp (e) Mrigal (f) Common carp

Fish production is a great source of protein to our diet.

Fish production is of two types :

(1) **Fin fish production/True fish production :** Production and management of cartilaginous and bony fishes such as pomphret, tuna, cod, catla, prawns, rohu etc.

(2) **Shelf fish production :** Production of shell-fish such as prawns, mollusks.

Depending on the mode of obtaining fishes, fishing are of two types :

(1) **Capture fishing :** Naturally living fishes in various water bodies are captured.

(2) **Culture fishing :** Fishes of desired variety are cultivated in confined areas with utmost care to get maximum yield. This is also called aquaculture. Aquaculture can be done in oceans, rivers, lakes, ponds etc. When it is done in oceans, it is called mariculture.

Marine fishing : Marine fishing includes fish production in ponds, rivers, reservoirs.

- Popular marine fishes includes Pomphret,Tuna,Sardines, Bombay duck. Some costly fishes found in sea like nullets, prawns, seaweed, oysters.
- Using satellites, regions of high fish population in sea can be found. Echo-sounders are also used.

Inland fishing : It includes fish production in fresh water (for example ponds, rivers, lakes, reservoirs) and brackish water (for example estuaries).

Composite Fish Culture : A fish culture system where 5 to 6 varieties of fish are reared in a single fish pond.

- They are selected so that they do not compete for food. They should have different food requirements.

Example :

Catla : Feeds in the upper part of water.

Rohu : Feeds in middle part of water.

Mrigals, common carps : Feeds at bottom.

- **Advantage :** More yield.

  Problems : Many fishes lay eggs during monsoons only, due to which number of fishes will not grow fast. So hormonal stimulation is used. Using this fishes can be made to reproduce any time.

Apiculture Bee-keeping : It is the practice of keeping, caring & management of honeybees on a large scale for obtaining honey and wax.

Many farmers use bee-keeping for additional small income. Also, there are big farms called apiaries/bee farms.

Apiary : The setting up of a number of bee hives in desirable location in a systematic manner that allows maximum pollen and nectar collection.

- Some common Indian varieties of bees include *apis carana indica* (Indian bee), *dorsata* (rock bee), *floral* (little bee).
- One Italian variety *mellifera* is also used in India for commercial large scale production because of its following advantage :

  (a) High honey collection capacity.

  (b) They reproduce fast.

  (c) They sting less.

  (d) They stay in a bee hive for long.

Honey : It is a dense sweet liquid.

- It is used in medicines. It is used as sugar.
- It is used as a source of energy.

Pasturage : Pasturage is the availability of flowers to the bees for nectar and pollen collection.

Or, Pasturage of flora is the type of crop, flower or other plants from which bee collects nectar and pollens to produce honey.

It affects the quality and quantity of honey because different flora produce nectar and pollen of different types *e.g.,* almond honey of Kashmir is very tasty.

QUESTIONS

VERY SHORT ANSWER

1. Why do we need food ?
2. Name some cereals which provide us carbohydrate.
3. What is kharif season? Name a few kharif crops.
4. What is manure? How is it prepared?
5. What is hybridization?
6. What is the main sources of irrigation in India?
7. What do you mean by mixed cropping.

SHORT ANSWER

1. What are pathogens? How are they transmitted?
2. Write the differences between manures and fertilizers.
3. What are the differences between broilers and layers.
4. Write the advantages of inter-cropping and crop-rotation.
5. What are the benefits of cattle farming.

LONG ANSWER

11. (*a*) What are the ways to protect food grains before they are stored for future use?

    (*b*) Write advantages of bee keeping.
12. What is composite fish culture? What is the main problem associated with this practice? What is the criteria of choosing fish for this type of culture.
13. What factors may be responsible for losses of grains during storage?
14. What are macro nutrients? From were the plants get it.

    Or

    Draw the diagram of Inter cropping.
15. Why should our food contain cereals, pulses, fruits and vegetables?

OBJECTIVE TYPE QUESTIONS.

I Match the following :

Column I		Column II	
a.	Micronutrient	p.	Soyabean
b.	Kharif crop.	q.	Bee
c.	Rabi crop.	r.	Wheat
d.	Apis mellifera	s.	Molybedinum

2. Manure and fertilisers are the main source of _____ supply to plants.
3. Growing two or more crops in definite row pattern is known as _____

II MCQ.

(i) The best way to increase the yield of wheat in India is

a. To sow seeds of improved varities.
b. To use tractors
c. To reduce the quantity of ration consumers.
d. To remone weeds from the wheat fields.

(ii) Birds specially grown for meat only is known as _____

a. Hybrid. b. Broiler. c. bird management.
d. Bird culture

(iii) The drones in honey bee are

a. Sterile male. b. fertile males.
c. Sterile female. d. fertile female.

(iv) Potato tuber wash and Iodine solution placed together change their colour to _____

a. Blue-Black. b. Blue.
c. Brick-red. d. Magenta.

(iv) Metanil yellow causes _____

a. Stomach ulcer. b. Diarrhoea.
c. Cancer. d. Paralysis.

Assertion and Reasoning Type Questions

Direction : In the following questions, a statement of assertion (A) in followed by a statement of Reason (R). Mark the correct choice as

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of Assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q1. Assertion (A) Vermicomposting is an important method of preparing compost,

Reason (R) : An earthworn is physically an aerator, crusher and mixer, chemically a degrader and biologically a stimulator of decomposition.

Ans. (a) The degradation of organic waste through the consumption by the earthworms is called vermi composting.

Q2. Assertion (A) - The basic objective in mixed cropping is to minimise the risk and insurance against the total crop failure.

Reason (R) - Wheat and chicken pea are examples of inter cropping.

Ans. (b) Both the assertion and season are true but here, the reason is not the correct explanation of assertion, the mixed cropping is done to minimise the risk and insurance against the crop failure due to abnormal weather conditions and wheat and chick-pea in an example for the same.