

Crop Rotation:-

The practice of growing of different crops on a piece of land in a preplanned succession.

Advantages of Crop Rotation:-

[i] It controls pests & weeds.

[ii] Crop rotation reduces the needs of fertilizers.

[iii] Several crops may be grown in succession with only soil preparation (ploughing).

[iv] By alternation between deep & shallow rooted crops, the soil may be utilised more completely.

Crop variety Improvement:-

The art of recognising valuable traits & incorporating them into future generation is very important in plant breeding. Breeder's search for individual plants that exhibit desirable traits.

[i] Need for Higher Crop Yield:-

[i] Higher Yield:- The main aim of crop improvement is to improve the productivity of economic produce e.g. grain, vegetables & fodder.

[ii] Improved quality:-

Quality considerations of crop products varies from crop to crop e.g. baking quality in wheat.

[iii] Biotic & Abiotic Resistance:-

Under different situations crop suffers due to biotic stresses (as diseases) & abiotic stressors (as drought).

[iv] Changes in Maturity duration:-

Uniform maturity will make the harvesting process easy & reduce the loss of produce during harvesting.

[v] Photo insensitivity & thermo-insensitivity:-
Development of photo-insensitivity & thermo-insensitive crop varieties will help in crossing the cultivation boundaries.

[vi] Desirable agronomic traits:-

If we develop these varieties of crop which contain desired agronomic traits then it will help in setting higher production.

Vip Wider adaptability :-

It help in stabilizing the crop production under different environmental conditions.

Crop Protection Management -

Field crops are infested with a variety of pests. A pest is any destructive organism which causes great economic loss by destroying crop plants and products obtained from them.

But there are various methods by which insects and diseases can be controlled.

One of the most common and effective method is the use of pesticides or biosides. which include ~~insecticides~~, fungicides

~~Pesticides~~ are sprayed on crop plants or used for treating seeds and oil.

We should avoid them while we adopt the preventive measures rather than allowing the crops to be infested by pests.

Some preventive measures are -

- (i) Selection of optimum time of sowing the crops
- (ii) Crop rotation and multiple cropping
- (iii) Clean cultivation
- (iv) ~~...~~

(a) Weed control - Weeds are unwanted plants in cultivated fields. In comparison of cultivated crops the seeds of weeds germinate easily, their seedlings grow faster. So, removal of weed plants from cultivated fields in early stage of crop is essential to harvest high input returns in terms of high yield.

Methods of weed control -

- (i) Mechanical Method → Under this we can have remove weeds pulled out by hands, ploughing, Transplantation, use harrow etc.
- (ii) Cultural method - It include proper bed preparation, timely sowing of crops, inter cropping and crop rotation.
- (iii) Chemical method - Chemical weed killers, called herbicides and weedicides are sprayed on weeds to kill them. This is called chemical method of control of weed.

Biological Control:-

Biological control of weeds involves the deliberate use of insects or some other organisms which consume and specifically destroy the weed plants.

Insect Pest Control:-

(i) Chewing Insects:- The chewing insects destroy all sort of crop plants. They cut root, stem & leaf of crop plants by help of their chewing mouth parts.

(ii) Sucking Insects:- The sucking insects suck the cell sap from various parts of the plants. They include various common pests of crop plants such as aphids.

(iii) Internal feeders:-

The internal feeders live inside the plants parts. They are called borers when they live in twigs or roots as sugarcane borers.

Storage of Grains:-

For getting seasonal foods regularly throughout the year

they are stored in safe storage.

Preventive & Control Measures:-

[i] Drying:-

The proper time of harvesting a crop is very important, because the time of harvesting a crop determines the yield of the crop.

[ii] Cleaning:-

The grain & other agriculture produce should be properly cleaned before their storage.

[iii] Safe and Proper Storage:-

Godown, warehouse & stores should be properly cleaned, dried & repaired.

[iv] Chemical Control:-

The pesticide solution is sprayed over the gunny bags containing food grain by using manual sprayer or a mechanical sprayer.

[v] Fumigation:-

Those pesticides which can destroy insects by forming toxic fumes are called fumigants & process of their use is called fumigation.

Animal Husbandry:-

The branch of agriculture that deals with the feeding, caring & breeding of domestic animals is called animal husbandry.

Cattle Farming:-

Cattle are next to land in use for farmers. Human beings domesticated them for milk, also for meat, leather & transportation.

Breeds of Cows:-

[i] Draught Breeds:-

Their meat is tough & they give little milk. Small and marginal farmers still make use of draught breeds of cow.

[ii] Dairy Breeds:-

They have large digestive

systems & a spacious udder. Because as much as possible of the food they consume must be turned into milk.

[ii] Dual Purpose breeds:-

These breeds provide milk as well as help in agricultural tasks.

Breeds of Buffaloes:-

[i] Murrah:- This breed has massive body, short & tightly curved horns. During its lactation period, its average yield of milk is 1800 to 2500 l with fat contents up to 7%.

[ii] Mehsana:-

Their milk production is about 1200 to 2500 l. They are known for giving milk at comparatively early age with regular breeding intervals.

[iii] Swati:-

Their average milk yield is

from 1600 to 1800. The fat content of milk is about 8 to 12 per cent.

Technique of artificial insemination:- The semen of a healthy & tough animal of high milk yielding breed is collected and preserved by freezing or chemical methods.

Precaution for Artificial Insemination:-

(i) The semen should be obtained from high quality male animal.

(ii) The female animal selected should be healthy & of sound breeding age.

(iii) Artificial insemination should be carried out only at the proper heat period of female animal.

(iv) The ~~instruments~~ used in artificial insemination should be properly sterilised.

Advantages of Artificial Insemination:-

(i) Bulls of selected breeds are kept in climatic conditions ~~not~~ most suitable for their healthy breeding.

(ii) The bulls are reared in most hygienic conditions under the direct supervision of experts.

(iii) Semen can easily be transported, even to remote places.

(iv) It gives high rate of successful fertilization.

Farm Management Practices

The requirement of proper cleaning & shelter for cows & buffaloes is must due to two reasons (i) for the production of clean milk. (ii) for the health of the animal.

Components of cattle feed:-

[i] Roughage:- It largely contains fibres such as green fodder etc.

[ii] Concentrates:-

The concentrates used in feed of cattle & buffaloes are a mixture of substances which are rich in one or more of the nutrients.

Poultry Farming:-

The poultry industry with its production in the form of eggs & meat is of particular importance in providing a balanced diet for the human population.

Poultry Breeds:-

(i) Desi / Indigenous:-

We have only four pure breeds of indigenous or desi fowls. They are Aseel, Chittagong, Ghagus & Bura.

(ii) Exotic Breeds:-

There are present numerous exotic breeds of poultry which have been successfully acclimatized in India.

(iii) Cross Breeds:-

The majority of the present day chickens used in production of eggs & meat are the cross breed blocks.

Variety Improvement:-

(i) Quality & Quantity of chicks.

(ii) Dwarf breeder parent for commercial chick production for summer adaptation capacity high temperature.

(iii) Low maintenance requirement.

Production of Eggs:-

A layer starts laying eggs at the age of 20 weeks. The eggs

production period in commercial layer is 500 days.

Production of Broilers.

Care is taken to prevent mortality & enable feathering & maintain carcass quality. They are produced as broilers & sent to market to be sold as meat.

Fish Production:-

Fish can be useful in eradicating problem of malnutrition. Fish liver oil is rich in vitamin A & D.

Fisheries:-

Fisheries are establishments connected with capture, preservation, exploitation and utilization of various types of fisheries.

(a) Fin Fishery:- It is capture management & exploitation of cartilaginous bony fishes.

(b) Shell fishery:-

It is the capture management & exploitation of crustaceans & molluscs.

It is of two types:-
[i] Capture fishery

[ii] Culture fishery

Based on the water sources of fish production following three types of fisheries can be recognised.

[i] Marine fisheries

[ii] Fresh water fisheries

[iii] Brackish water fisheries

[i] Marine Fisheries:-

They include capture fisheries of oceans & seas.

[ii] Aquaculture:-

Aquaculture pertains to production of useful aquatic plants and animals by proper utilisation of available waters in the country.

[iii] Inland Fisheries:-

Inland capture fisheries are rapidly expanding in our country. Increasing pollution of water is adversely affecting the inland fisheries.

[iv] Composite Fish Culture:-

Fish production by culturing a single species in a pond using old tradition methods gives a low yield, but if several species of fish are stocked together in a pond, the production increases with the same cost.

Bee keeping:-

Bee keeping or apiculture is the rearing, care & management honey bees for obtaining honey, wax & other substances. Honey is known for medical value.

Products Obtained from apiculture

[i] Honey:-

It is a sweet, viscous edible fluid containing sugars, water or moisture, minerals, vitamins, amino acids, enzymes & pollen. Sugars present in honey include fructose, dextrose, sucrose & dextrin.

[ii] Bee wax:- It is a wax of high melting point. It is secreted by wax glands of worker bees. Bee wax is utilized in the construction of hive.

[iii] Propolis:- It & balms are other collections of bee from the plants. These substances are used in fastening of comb.

[iv] Poison:- Poison of bee is used in manufacturing of certain Ayurvedic & Homeopathic medicines.

Honey Bee Varieties used for Bee keeping:-

There are two honey bee varieties used for bee keeping:-

[i] Indigenous Varieties of Honey Bees.

[ii] Exotic Varieties of Honey Bees.

Colony & Caste of Honey Bee:-

Honey bee is a

social insect. The nest of the honey bee is known as the bee-hive. Honey bees provide a good example of team work & division of labour.

There are three types of castes of honey bees:-

- (i) Queen
- (ii) Drone
- (iii) Worker

Management for High Yield of Honey:-
An apiary is a place where bee hives are kept to get honey & other products of bee. To obtain good quality and higher yields of honey the following considerations are done:-

- (i) Pasturage / crop / flora.
- (ii) Bee-hive.
- (iii) Apiary location
- (iv) Honey flow & seasons.
- (v) Swarming (Reproduction)
- (vi) Selection of variety of honey bee and site selection for bee keeping.

Diseases & enemies of Honey Bee:-

Bees are commonly infected by ~~viruses~~ ^{Honey} viruses, bacteria, fungi and protozoa.