



CHAPTER 17 FOOD HIGHER YIELDS

NOTES

PLANT BREEDING

- **Plant breeding** is the process of developing new varieties, particularly in plants through selection and cultivation.
- **Selection** is the most important method of breeding, the availability of **variation** is its first prerequisite. The process of selection started with **domestication** by early man (**wild species are brought under human management**).

HYBRIDIZATION

- The crossing of two different plants having different traits to bring together in a single individual is known as hybridization.
- **Hybridization followed by selection** has been major tool for plant breeding.

COMBINATION BREEDING

- In this method two parents are crossed and progeny with desired traits are back crossed with recipient parent.
- The aim is to transfer one or more desired characters from many plant types into a single one.
- It is carried out by **backcross method**.

HYBRID VARIETIES

- The exploitation of better yielding hybrid in plants is known as **hybrid vigour or heterosis**.
- It may be between **same type** of plants or totally **different plants (distant hybridization)**.

CROP PRODUCTION MANAGEMENT (nutrient management, irrigation and cropping pattern)

- The various scientific aspects and systematic management so as to obtain maximum yield, is known as crop production management.
- It includes 3 important components namely **nutrient management, irrigation and cropping pattern**.

NUTRIENT MANAGEMENT (Fertilizers, Manuring, Compost, FYM, Oil cakes, Green Manures, Vermicomposting)

- **FERTILIZERS** are naturally occurring or synthetic chemicals containing plant nutrients.
- **The excessive use of chemical fertilizers** creates **pollution** and **health problems**.



- The soil nutrients can also be replenished through **crop rotation** and **fallowing**.

MANURING is the addition of manures to the soil.

- Manures are the organic substances containing plant nutrients derived from plant and animal waste.

COMPOST is a kind of organic manure artificially prepared from plant residues and animal waste products. The process involved is known as composting.

- **Types of Compost: Rural Compost and Urban Compost.**

FARM YARD MANURE is a mixture of the solid and liquid excreta of farm animals along with litter and left-over materials from roughages or fodder feed to the cattle.

OIL CAKES are by-products of oil seeds.

- **Types: edible oil cakes and non-edible oil cakes**

GREEN MANURING is the practice of growing, ploughing and mixing of green crops with soil to improve its physical structure and fertility. The manure so obtained is known as **green manure**.

VERMICOMPOSTING is the process of breakdown of organic matter by some species of earthworms. The product obtained is called **Vermicompost**.

Vermicompost provides benefits to the soil:

- Improve the physical structure, water holding capacity.
- Enriched soil micro-organism, adding hormones and enzymes.
- Enhanced germination, plant growth.
- Improved root growth and structure

IRRIGATION: The artificial application of water is called irrigation.

TYPES OF IRRIGATION:

- Surface irrigation
- Overhead (sprinkler) irrigation
- Drip (Trickle) irrigation

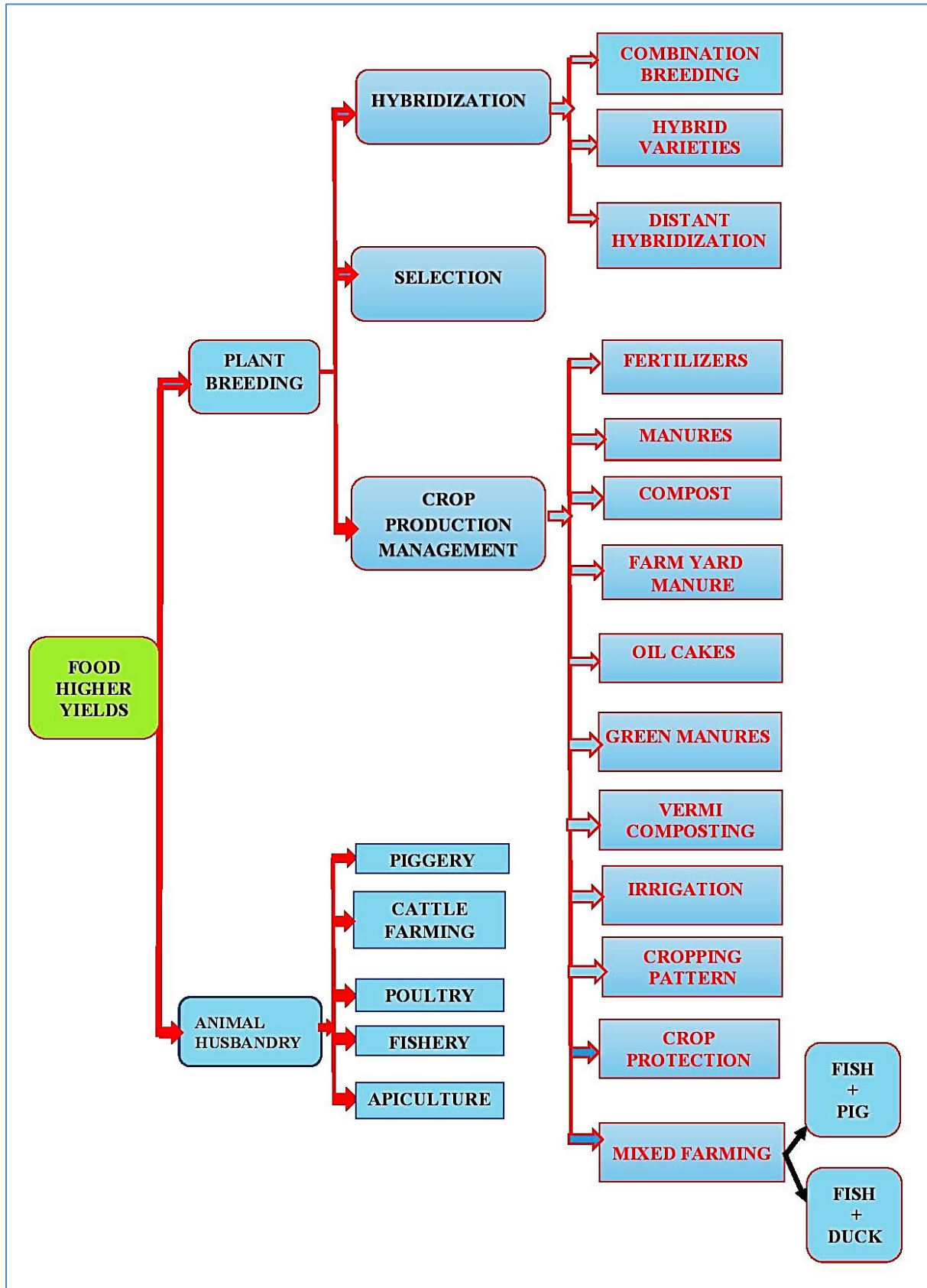


Fig. Flowchart of Food Higher Yields



CROPPING PATTERN

Mixed cropping is a system of sowing two or three crops together on the same land, one being the **main crop** and the others the subsidiaries.

- **Mono-cropping,**
- **Double-cropping** and
- **Multiple-cropping**

CROP PROTECTION: Pests are the organisms that damage our crop plants.

Environment friendly: biochemical pesticides, microbes and pesticidal substances etc. are being used.

MIXED FARMING is the combination of two independent agricultural enterprises on the same farm.

- **Integrated fish farming** is a combined culture of **fish together** with compatible combinations with **poultry, duckery, pig rearing** and **cattle**.
- Integrated **fish-pig** and integrated **fish-duck**.

Advantages of organic farming:

- Higher market prices,
- Less intensive use of land,
- Better balance between supply and demand for agriculture products and
- Better protection of the environment.

ANIMAL HUSBANDRY is the agricultural practice of breeding and raising livestock.

- **Piggery, cattle farming, poultry farming,** etc. are common animal husbandry practices.

PIGGERY: The agricultural practice of rearing of pigs to obtain **meat, manure** as well as **bristle** is known as **piggery**.

- Exotic breeds recommended for pig farming in Manipur are **Yorkshire, Hampshire, and Berkshire**.

CATTLE FARMING: production of **milk** (for certain sections good source of meat).

- **Red Sindhi and Sahiwal** are two Indian breeds of cattle whereas **Holstein and Jersey** are two exotic breed of cows.



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POULTRY: The domestication of fowl to obtain eggs and meat is known as **poultry farming**.

- **Layer chickens** are fast growing varieties that produce eggs.
- **Poultry birds** are efficient converter of agricultural by-products that can provide additional income and employment to the farmer.
- **Poultry breeds** - *Rhode Island Red, White leghorn etc.*

FISH PRODUCTION

- Fishes are **cheap sources of protein**.
- The best way of fish farming is under **artificial condition**.
- In **composite fish culture**, more than one type of compatible fishes are cultured simultaneously.

Technical requirement: Construction of pond, pond management (pre-stocking including liming & pond fertilization), stocking, post-stocking (supplementary feeding & manuring) and harvesting.

BEE KEEPING OR APICULTURE

- The rearing of honey bees for obtaining **honey and wax** is known as **apiculture**.
- Bees are said to be polymorphic species, having 3 castes in a colony – **Worker, Queen, and Drone**.
- **Workers** are diploid sterile females, do **household chores**, secrete wax, **build hive**, collect nectar and **convert into honey**.

The important species of bees used in India:

- *Apis indica*
- *Apis dorsata*
- *Apis florea*
- Hive may be **natural** or **artificial** (**Langstroth, Newton and Jeolikote in India**).
