

Animal husbandry

Raising, breeding and care of livestock

Inbreeding

Mating closely related individuals of the same breed

Used to develop pure lines

Increases homozygosity

Inbreeding depression-
reduction in fertility and productivity due to continued inbreeding

Out-breeding

Mating unrelated individuals

E.g. out-crossing, cross-breeding, interspecific hybridisation

Out-crossing

Mating animals of the same breed but not related for 4-6 generations

Helps in overcoming inbreeding depression

Cross-breeding

Mating animals of different breeds

Allows combination of desirable traits from two breeds

E.g. *Hisardale*, cross-breeding variety of Bikaneri ewes and Merino rams

Interspecific hybridisation

Mating individuals of two different and related species

E.g. Mule, a hybrid offspring of a male donkey and a female horse

Green revolution

Initiated by Norman Borlaug

M. S. Swaminathan- founder in India

Adopting modern practices in agriculture to get high yield by using fertilisers, pesticides, high yielding and disease-resistant varieties, etc.

Germplasm collection

Collection of plants or seeds having all the genes and alleles in a given crop

High-yielding and disease-resistant varieties of wheat

Sonalika, Kalyan sona

Himgiri- resistant to leaf and stripe rust, hill bunt

Semi-dwarf varieties of rice

Derived from cross-breeding IR-8 and Taichung Native-1, e.g. IR-36, etc.

Jaya and Ratna developed in India

High-quality sugarcane variety

Developed by crossing *Saccharum barberi* (north India) and *Saccharum officinarum* (south India)

Disease-resistant crop varieties

Pusa swarnim (Karan rai) - *Brassica* resistant to white rust

Pusa shubhra, Pusa snowball K-1- Cauliflower resistant to curl blight black rot

Pusa komal- cowpea resistant to bacterial blight

Pusa sadabahar- chilli resistant to leaf curl and TMV

Prabhani kranti- resistant to yellow mosaic virus

Mutation breeding

Inducing genetic variation by mutation

E.g. Mung resistant to powdery mildew and yellow mosaic virus

Insect or pest resistant varieties

Pusa Gaurav- *Brassica* variety resistant to aphids

Pusa Sem-2 & 3- Flat bean variety resistant to fruit borer, aphids and jassids

Pusa Sawani, Pusa A-4- Okra variety resistant to shoot and fruit borer

Biofortification

Increasing the nutritional value of crops by selective breeding

Atlas 66- wheat variety with high protein content

Maize with high lysine and tryptophan content

Rice with five times more iron content

Single Cell Protein (SCP)

Edible organisms, rich source of protein, e.g.

Algae- *Spirulina*, *Chlorella*

Bacteria- *Methylophilus methylotrophus*

Fungi- *Saccharomyces*,
Fusarium

Explants

Any part of a plant used to grow tissue culture

Totipotency

Capability of a cell or an explant to develop into a whole plant

Somaclones

Plants produced by tissue culture

Micropropagation

Producing thousands of plants through tissue culture

Somatic hybridisation

Production of somatic hybrids by fusing protoplasts of two different varieties