9. Plant Breeding

Learning Objectives

The learner will be able to

- ❖ Appreciate the relationship between humans and plants.
- ❖ Recognise the origin of agriculture.
- ❖ Perceive the importance of organic agriculture.
- ❖ Understand the different conventional methods of plant breeding.

Important Notes and Points

- ❖ **Indian Plant Breeders Dr. M. S. Swaminathan** – He is pioneer mutation breeder.
- ❖ **Sir. T.S. Venkataraman** – An eminent sugarcane breeder.
- ❖ **Dr. B.P. Pal** – Famous wheat breeder, developed superior disease resistant varieties of wheat.
- ❖ **Dr. K. Ramiah** – Eminent rice breeder, developed several high yielding varieties of rice.

- **N.G.P. Rao** – An eminent sorghum breeder, developed world's first hybrid of Sorghum (CSH-1).
- **C.T. Patel** – Who developed world's first cotton hybrid.
- **Choudhary Ram Dhan** – Wheat breeder, who is famous for C-591 variety of wheat, which is made Punjab as wheat granary of India.
- National Bureau of plant Genetic Resources (NBPGR) The Bureau is responsible for introduction and maintenance of germ plasm of various agricultural and horticultural station in our country. It is also responsible for maintenance of plant materials of botanical and medicinal interest. It is located at Rangpuri, New Delhi and has four regional plant quarantine stations at Amristsar, Kolkata, Mumbai and Chennai at Meenambakkam.
- **Gamma Garden or Atomic Garden:** Is a form of mutation breeding where plants are exposed to radioactive sources typically cobalt-60 or caesium-137 in order to generate desirable mutation in crop plants. The first Gamma garden in India is Bose Research Institute at Calcutta in 1959 and the second is IARI in 1960 which produced large variation in short type.

- NORIN 10 – The cultivars found that Norin 10 dwarfing genes have high photosynthetic rate per unit leaf area and increase respiratory activity. Gonjiro Inazuka selected the semi-dwarf wheat variety that became Norin 10. He would have never thought that the semi dwarf genes would not only revolutionize the world of wheat but also helped to save more than one billion lives from hunger and starvation.
- **Biofortification** – breeding crops with higher levels of vitamins and minerals or higher protein and healthier fats – is the most practical means to improve public health.
- **Sugar cane:** *Saccharum bareri* was originally grown in North India, but had poor sugar content and yield. Tropical canes grown in South India *Saccharum officinarum* had thicker stems and higher sugar content but did not grow well in North India. These two species were successfully crossed to get sugar cane varieties combining the desirable qualities of high yield, thick stems, high sugar and ability to grow in the sugarcane areas of North India.