

CELL BIOLOGY, GENETICS AND PLANT BREEDING

Unit-I: CELL BIOLOGY

Structural organisation of the plant cell - Cell wall - primary and secondary - Plasma membrane - structure, models and functions, channels, pumps and receptors - plasmodesmata. Ultrastructures of Chloroplast and Mitochondria, Chloroplast and Mitochondria's genomes

Unit-II: CELL BIOLOGY

Structure and functions of Glyoxysomes, Peroxisomes, Spherosomes and Lysosomes. Ultrastructure of Nucleus, structure and organisation of Chromosomes. DNA types - Replication methods and DNA repair mechanisms. RNA types and functions - Genetic code - Lac operon and Trp operon - Programmed cell death (PCD).

Unit-III: GENETICS

Linkage and crossing over - Tetrad analysis - Sex determination in plants - Sex limited and sex linked inheritance - Cytoplasmic inheritance - Male sterility, mechanisms, cytoplasmic, genetic and cytoplasmic and genetic male sterilities and applications.

Unit-IV: GENETICS

Mutation - Biochemical basis, induction, mutagenic agents - Physical and chemical mutagens, reverse and suppressed mutations. Polyploidy - types, induction, role in plant breeding. Population genetics - Hardy and Weinberg Law.

Unit-V: PLANT BREEDING

Genetic variability and its role in plant breeding - Breeding methods in self pollinated, cross pollinated, vegetatively propagated and apomictic plants. Inbreeding depression - Role of heterosis and hybrid vigour in plant breeding. Plant breeding techniques. Somaclonal variation in crop improvement. RFLP in plant breeding.

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Plant Breeding

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