Heteroisis leads to superiority in adaptation, yield,

Heteroisis was first introduced by Shull in the year 1914.

Features of Heterosis: 1. Superiority over Parents: Hybrid vigour/ Heterosis leads to Superiority in adaptation, yield, quality, disease resistance, maturity and general vigour over its parents. 2. Confined to F1: Heterosis is confined only to the F1 generation of a cross. It declines and disappears in F2 and subsequent generations of a cross as a consequence of segregation and recombination. 3.

Genetic Control: Expression of heterosis is governed by nuclear genes. It results due to interaction between nuclear genes and cytoplasm. 4. Reproducible: Heterosis once identified can be easily reproduced in a definite environment. 5. Association with SC A: It has positive association. SCA is a measure of dominant variance and a significant amount of dominant variance is essential for heterosis breeding. 6.

Effect of heterozygocity: Magnitude of heterosis associated with heterozygocity because the dominance variance is associated with heterozygocity. 7. Conceals recessive Genes: In case of heterosis, the deleterious effect of recessive genes are covered by the favourable effect of dominants. 8. Low frequency: The frequency of desirable heterotic combination is very low. All the F1 crosses donot show desirable heterosis.

Fixation of heterosis: 1. Vegetative propagation: Which is based on mitosis. As a result genotype is transmitted intact to all its vegetative progeny. In crops like, sugar cane, potato, sweet potato, banana, where vegetative propagation is a rule, hybrids can be easily developed.

2. Apomixis: Here the seed develops without fertilization. If F1 and its progeny produce only apomictic seeds having 2n embryos, the F2 and subsequent generations will be identical in genotype to the F1 and there by lead to the fixation of heterosis. 3. Balanced lethal system: In plants like, Oenothera, the homozygotes will die as they are lethal and only heterozygotes survive, which results in the fixation of heterosis.

4. Polyploidy: Heterosis can also be fixed by chromosome doubling or polyploidy especially in interspecific and intergeneric hybrids. For e. g.

the heterosis in wheat-rye cross can be conserved in amphidiploid hybrids through chromosome doubling. Factors affecting heterosis: I. Mode of pollination: Level of heterosis higher in cross pollination than self pollination crops. II.

Genetic diversity of parents: Higher heterosis associated with crosses of more distantly related parent and maximum heterosis occurs at optimum or intermediate level of parental diversity. III. Genetic base of parents: If the genetic base is broad, then the heterosis will be higher. IV. Adaptability of parents: If the parents are having wider adaptability, then there will be the occurrence of heterosis. Advantages: i.

Higher yield potential. ii. More uniform and attractive. iii. Can be developed in cross pollination and self pollination crops. iv. Can be possible to reconstitute the hybrid with same genotype.

Disadvantages: i. Fresh seed to be produced every year. ii. Hybrid seed is costlier. iii. Cultivation require more inputs. iv.

Requires more technical skill.