

## PLANT BREEDING

Kumari Sona Rani  
Assistant Professor  
department of Botany  
S.Sinha college ,Aurangabad

For M.Sc 2<sup>nd</sup> semester students

Plant breeding, **application of genetic principles to produce plants that are more useful to humans. This is accomplished by selecting plants found to be economically or aesthetically desirable, first by controlling the mating of selected individuals, and then by selecting certain individuals among the progeny. Such processes, repeated over many generations, can change the hereditary makeup and value of a plant population far beyond the natural limits of previously existing populations.**

Plant breeding is a method of altering the [genetic](#) pattern of plants to increase their value and utility for human welfare. It is a purposeful manipulation of plants to create desired plant types that are better suited for cultivation, give better yield and are disease resistant. Plant breeding is done for the following

### **objectives –**

- Increase the [crop](#) yield
- Improve the quality of the crop
- Increase tolerance to environmental conditions like salinity. extreme [temperatures](#) and drought
- Develop a resistance to pathogens
- Increase tolerance to the insect pest

## **Steps for Different Plant Breeding Methods**

The main steps of the plant breeding program are as follows-

### **1. Collection of Variability**

Wild varieties species and relatives of the cultivated species having desired traits should be collected and preserved. The entire collection having all the diverse alleles for all genes in a given crop is called *germplasm collection*. Germplasm conservation can be done following ways-

- In situ conservation – It can be done with the help of [forests](#) and Natural Reserves.
- Ex situ conservation- it is done through botanical gardens, seed banks.

### **2. Evaluation and Selection of Parents**

The germplasm collected is evaluated to identify the plants with desirable [characters](#). It is made sure that only the pure lines are selected. The selected plants are multiplied and used in the process of hybridization.

### **3. Hybridization**

The Pollen Grain from one desired parent plant selected as a male parent is collected and dusted over another plant which is considered as the female parent.

### **4. Selection and Testing of Superior Recombinants**

Progeny obtained after crossing are evaluated for the desired combination of characters. These are self-pollinated for several generations till there is a state of uniformity so that the characters will not segregate further.

### **5. Testing Release and Commercialization of New Cultivars**

The selected plants are evaluated by growing the plants in an experimental field and the performance is recorded. This is done for at least 3 growing Seasons at different locations in the [country](#).

## **Indian Hybrid Crops**

### **Wheat and Rice**

In the 1960s, wheat and rice production increased tremendously. Norman E. Borlaug developed semi-dwarf varieties of wheat. *Sonalika* and *Kalyan Sona* are two of the hybrid wheat varieties grown in India. Semi-dwarf wheat varieties were taken from IR-86 (International Rice Research Institute) and Taichung native-I (from Taiwan). *Jaya* and *Ratna* are the better-yielding, semi-dwarf rice varieties that were later introduced.