# Quadrant II – Transcript and Related Materials

**Programme:** Bachelor of Science (Third Year)

**Subject:** Botany

**Course Code:** BOC 108

**Course Title:** Cytogenetics and Plant Breeding

**Unit:** Methods of Crop Improvement

**Module Name:** Hybridization for Cross-pollinated Plants- Part 2

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**Notes**

For cross-pollinated plants, six hybridization-cum-selection methods have been recognised. They are as follows:

1. Single cross
2. Double cross
3. Three-way cross
4. Top cross
5. Polycross
6. Synthetic cross

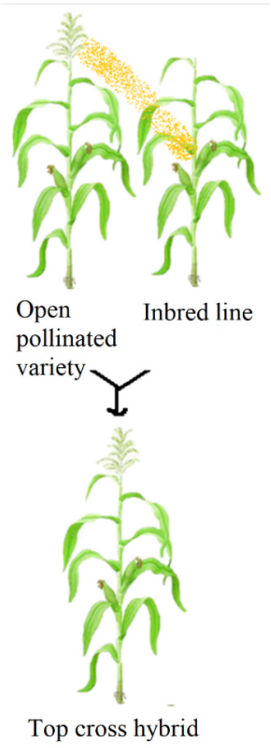
Of these, the first three methods have been discussed in detail in the previous module. Let us look at the other three in this module.

- **Top cross**

Top cross is the cross made between an inbred line and an open pollinated variety. Such a cross is also known as inbred-variety cross (Variety X Inbred).

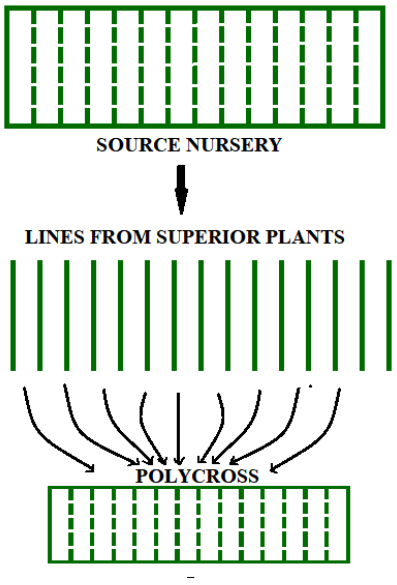
Besides creating a new hybrid, this method helps to check the general combining ability of an inbred line.

The open pollinated variety is used as male parent and the inbred line to be tested is used as female parent.



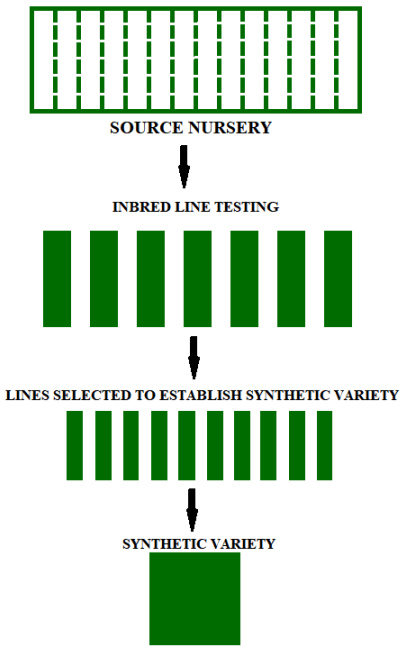

- **Polycross**

Polycross is the cross between several selected inbred lines which are allowed to outcross freely with other selected lines in the same nursery. The selected lines are planted in isolation in a field called **polycross nursery.** Planting is done in such a manner as to encourage random inter-pollination. Seeds produced are assembled, tested and released as variety, if found promising.




Polycross method is most suitable for obligate cross pollinators. The method provides equal opportunity for each and every clone to cross with each other in a block. This technique is useful in cases where individual pollination is difficult.

- **Synthetic cross**




Synthetic cross is made by crossing in all combinations, a number of pretested inbred lines that combine well with each other. This is done by open pollination of these inbred lines in isolation. Seeds so produced are mixed in equal proportion and sown in isolated plots. Natural cross pollination takes place and the seeds are harvested, tested and released as variety, if found promising.

Synthetic cross differs from polycross in that the lines involved in synthetic cross are pre-tested. This method helps in developing synthetic varieties in crops where individual pollination is difficult.

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