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Seed trees II - Avoid inbred seed

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Seed trees II – Avoid inbred seed

Inbred seed is poor seed

Most forest trees are outcrossing, meaning that they only or preferably sets seed if they have been pollinated by trees they are not related to. In that way the trees get more robust and adapted to changing environments. If there are no trees around of the same species, some trees will self-pollinate which means that their flowers will be pollinated from other flowers within the same tree. Sometimes they form fruits without seed inside, sometimes they form seed of poor quality. Seeds that forms as a result of self-pollination is called inbred seed. We would like to avoid collecting inbred seed because we have experienced that inbred seed tend to give poor offspring. We cannot see on the tree or fruits if they are products of inbreeding, but we can minimize the risk of collecting such seed by selecting seed trees that will most likely be outcrossing, and avoiding trees that have a higher risk of inbreeding.

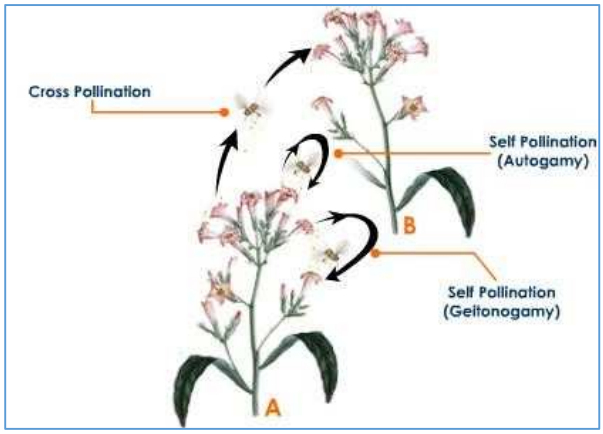

Figure 1. The principle of self and cross pollination. A and B represent two different trees.

Isolated trees

In farmland, trees of the same species may often grow far away from each other because the trees in between have been cut down. Isolation may also be if trees flower very early or very late compared to other trees of their kind. In both cases, cross-pollination with other trees is difficult.

Species with large flowers pollinated by birds and bees have a higher chance of being cross pollinated because bees and birds ten to move long distances between flowering individuals.

Figure 2. Erythrina flower pollinated by a sunbird

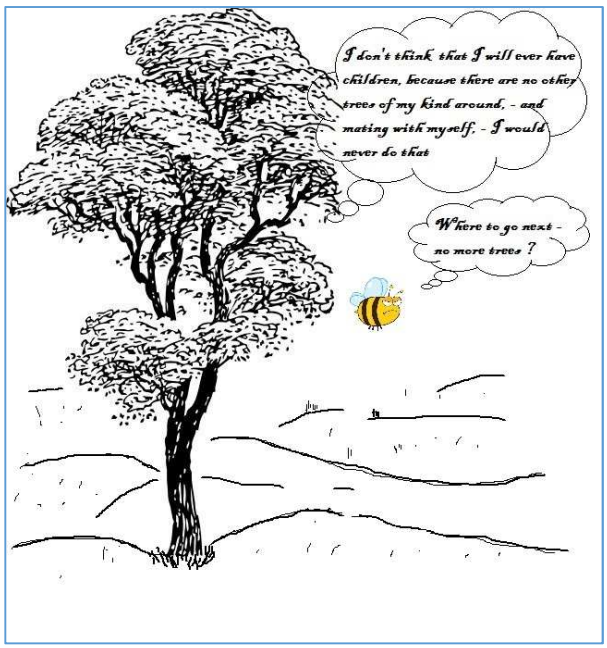

Figure 3. Trees may be functionally isolated from pollination if they grow scattered in open land, or if there is no other tree of the same species around

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Seeds should not be collected from isolated trees with no trees of the same species withing pollination distance, because seeds may have poor and inbred seed

Functionally isolated trees

Trees that grow within pollination distance from other trees of their kind may still be functionally isolated, if they cannot cross pollinate with these these neighbouring trees. That could happen if:

1. The trees flower out of phase with the other trees, either very early or or very late
2. Tre trees are the same genotype or closely related e.g. ramets from the same clone or siblings raised from the same mother trees.
3. The neighbouring trees are too young to flower
4. Dioecious trees where neighbouring trees are of the same sex, - either male or female trees

Summary, do's and don'ts

Do's

- Collect seed during the main / peak season
- Collect from trees with many fruits

Don'ts:

- Don't collect from trees with long distance to others of the same species (isolated trees)
- Don't collect from trees that may have been functionally isolated

Selected readings

Zobel B and Talbert J. Applied forest tree improvement. The Blackburn Press. 505 pp

FAO 2020: The pollination service of trees.

Sedgley M and Griffin AR 1989. Sexual reproduction of tree crops

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This Development Brief was written as an extension note to training at PATSPO project in Ethiopia