

# CONTROLLED POLLINATIONS REVEAL SELF-INCOMPATIBILITY AND INBREEDING DEPRESSION IN THE NUTRITIONALLY IMPORTANT PARKLAND TREE, *PARKIA BIGLOBOSA*, IN BURKINA FASO

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This paper presents results from a trial with controlled self- and cross-pollination of the semi-domesticated fruit tree, *Parkia biglobosa* (Fabaceae). We used eight trees acting as fathers and mothers in a diallelic cross.

Due to over-exploitation, low regeneration and reduced rainfall the density of *P. biglobosa* trees is declining in the landscapes in West Africa, and we expect more self-pollination because of increased distances among trees. Since *P. biglobosa* is known as a mostly outbreeding species, we wanted to reveal a potential effect of increased selfing by comparing fruit set and seed germination after self- and cross-pollination.

The trial took place in a village in Burkina Faso. The flowers are gathered in spherical capitula flowering synchronously. We treated each capitulum as a unit and covered the randomly selected capitula with nettings the day before the controlled pollination. Treated capitula were re-bagged after pollination. We used nine capitula per pollen donor per tree.

The results clearly showed a higher fruit set after cross-pollination. Only two fruits were produced from the controlled self-pollination (72 capitula) compared with 2,643 fruits from cross-pollination (423 capitula). Moreover, we found a few pairs of trees which produced as few fruits as self-pollination, suggesting a system of self-incompatibility.



*Parkia biglobosa* with treatment label and immature green pods, Pinyiri, Burkina Faso

Because, we only got two self-pollinated fruits, we borrowed fruits from a larger trial in the same village. We compared seed germination and seedling growth from seeds of 24 self- and 24 cross-pollinated fruits from the same eleven trees. The mean seed weight was higher for the cross-pollinated seeds.

The selfed seeds germinated as well as the outcrossed ones, but the growth and the survival of the seedlings were statistically higher for the outcrossed seedlings. The gap between the development of selfed and outcrossed seedlings increased with time and suggests presence of inbreeding depression.