# Assessing the impact of self-incompatibility on cocoa trees in Cameroon


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## Objective

Assess the impact of self –compatibility on several agronomical traits of cocoa trees.

In this study, the performances of self-compatible cocoa trees were compared to those of self-incompatible belonging to the same full-sib progenies.

## Material and methods

94 cocoa trees were identified as self-compatible (SC) or self-incompatible (SI) after the assessment of the % of cherelles surviving 14 days after hand-pollination using self-pollen.

These trees belong to nine full sib progenies assessed since 2008 in a trial plot set up in 2005 in the IRAD station of Barombi-kang (Cameroon), which aims at comparing the performances of 26 full-sib progenies.

| Female parent | Male parent | Number of trees identified as self-compatible (SC) | Number of trees identified as self-compatible (SC) |
|---|---|---|---|
| UPA 134 | SNK 64 | 1 | 4 |
| SNK 614 | SCA 24 | 2 | 2 |
| SNK 625 | NA 33 | 6 | 13 |
| PA 4 | Pound 7 | 1 | 1 |
| T 60/887 | ICS 89 | 3 | 5 |
| SNK 12 | PA 150 | 7 | 15 |
| T 60/78 | T 85/87 | 4 | 11 |
| MAN 15/2 | T 85/799 | 1 | 1 |
| AI/154 | T 60/78 | 3 | 14 |
| **TOTAL** | | **28** | **66** |

**Genetic origin of the assessed trees**

X X X
X X X
X X X
P1 P2 P3

**Spatial design**

Each progeny is represented by five rows of trees scattered in the plot, in such a way that each assessed cocoa tree (**X**) is surrounded by two trees issued from the same cross (**X**) and six trees issued from two other crosses (X and X)

## Results

| Trait | Effect of genetic origin (p) | Effect of self-compatibility (p) | S.C trees mean value | S.I trees mean value |
|---|---|---|---|---|
| Yield earliness (number of pods yielded during 2008-10 period) | 0.94 | 0.3 | 35 | 27 |
| **Yield (number of pods yielded during 2010-14 period)** | **0.033** | **0.017** | **121.5** | **100.5** |
| Vigor (trunk circumference) (cm) | 0,2 | 0,7 | 38.5 | 37.8 |
| Yield efficiency (yield/vigor) (pods/cm) | 0.1 | 0.36 | 3,1 | 2,7 |
| Susceptibility to BP disease (% rotten pods during the 2010-16 period) | 0,47 | 0,42 | 39.6 | 38.7 |
| Mean weight of 1 dried bean (g) | 0.91 | 0.91 | 1,3 | 1,29 |
| Mean number of beans per pod | **0,01** | 0,76 | 36.5 | 36.2 |
| Mean % of flat beans per pod | 0.92 | 0.36 | 2.6 | 1.9 |

**Results from a two factor ANOVA**

The SC trees were found to yield a significantly higher number of pods than the SI trees.
This finding indicates that self-compatibility can have a positive effect on yield, even in cocoa plots planted with trees from various genetic origins.


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