

Output

RTB-CA2.3.2.3 - Protocols for rapid cycling recurrent selection

Deliverable

22337-Improved flower inducing technology for producing both hybrid and self-pollinated seeds

Description

In 2021 we will assess the effect of different dosages of BA on the feminization of male flowers. This is important for producing hybrid or self-pollinated seeds.

Report

To verify the effectiveness of the flower-inducing technology, we carried out two experiments. One experiment is to understand the effect of photoperiod extension on the earliness of branching, and the other is to test the best practice of flower inducing, including photoperiod extension, pruning, and growth regulators.

The first experiment evaluated 139 breeding progenitors to understand the days required for the first and 2nd branches under natural light and photoperiod extension. We observed that photoperiod extension dramatically reduced the days needed for the first branch (flowering; **Figure 1**). For the progenitors with erect plant architecture, the days required for the first branches were reduced from six months to 3-4 months. Thus, we concluded that photoperiod extension could induce early branching, making speed breeding possible in cassava.

In the 2nd experiment, we applied six treatments for 13 breeding progenitors with different plant architectures (**Figure 2**). The results confirmed the photoperiod extension induced early branching. Under photoperiod extension, we observed that the combination pruning and BA (6-Benzylaminopurine) gave us the best results, most significant amount of fruits and seeds (**Figure 3**). With the addition of STS (silver thiosulfate), we got a marginal improvement for only a few progenitors. Considering the complication of applying STS, we decided to use the combination of photoperiod extension, pruning, and BA as the flower-inducing technology in cassava breeding practice. We are writing the manuscript to publish the results and provide the protocol for the cassava breeding community.

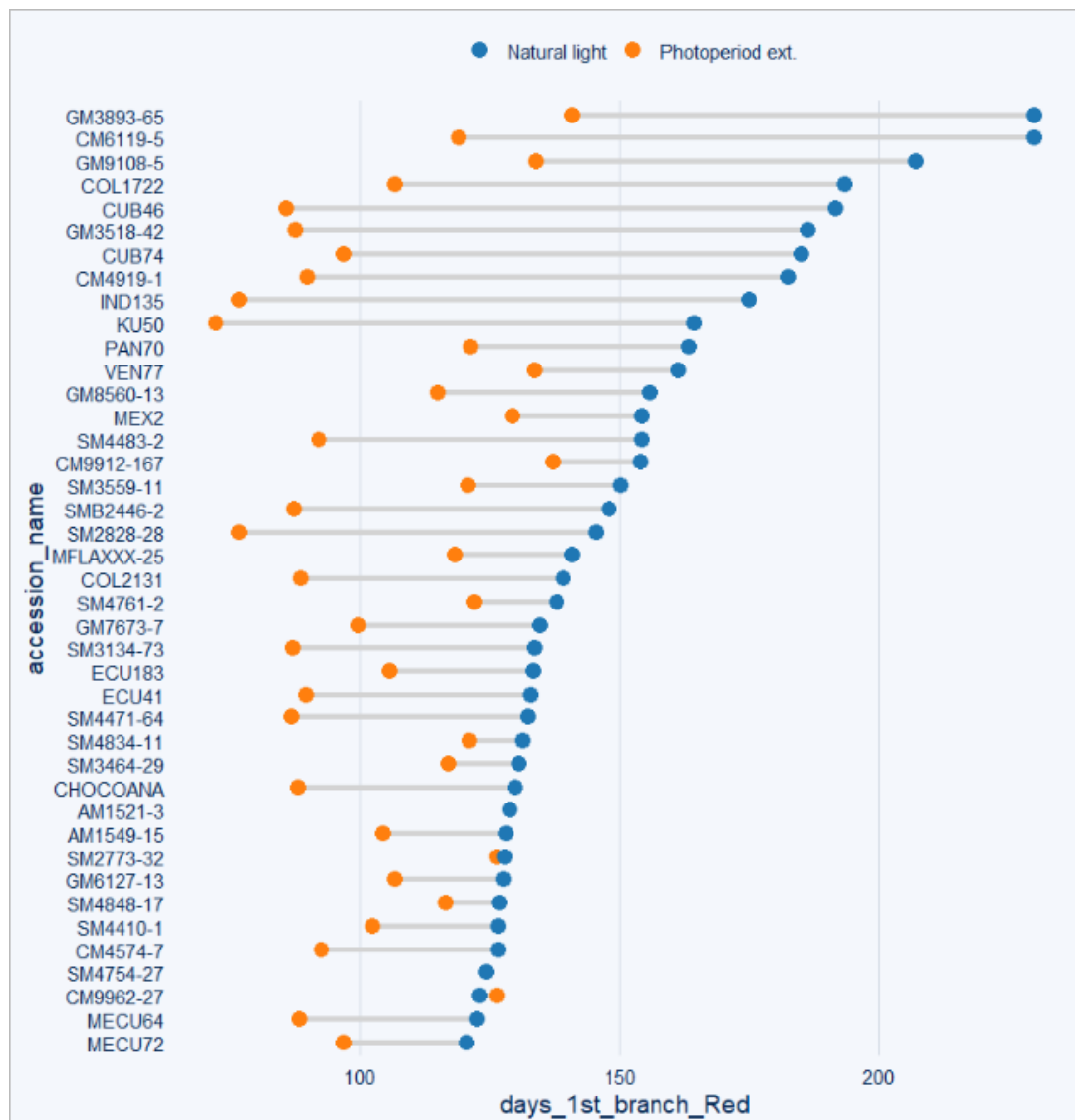


Figure 1. The photoperiod extension dramatically reduced the days required for the first branch (flowering), especially for the late-branching progenitors.

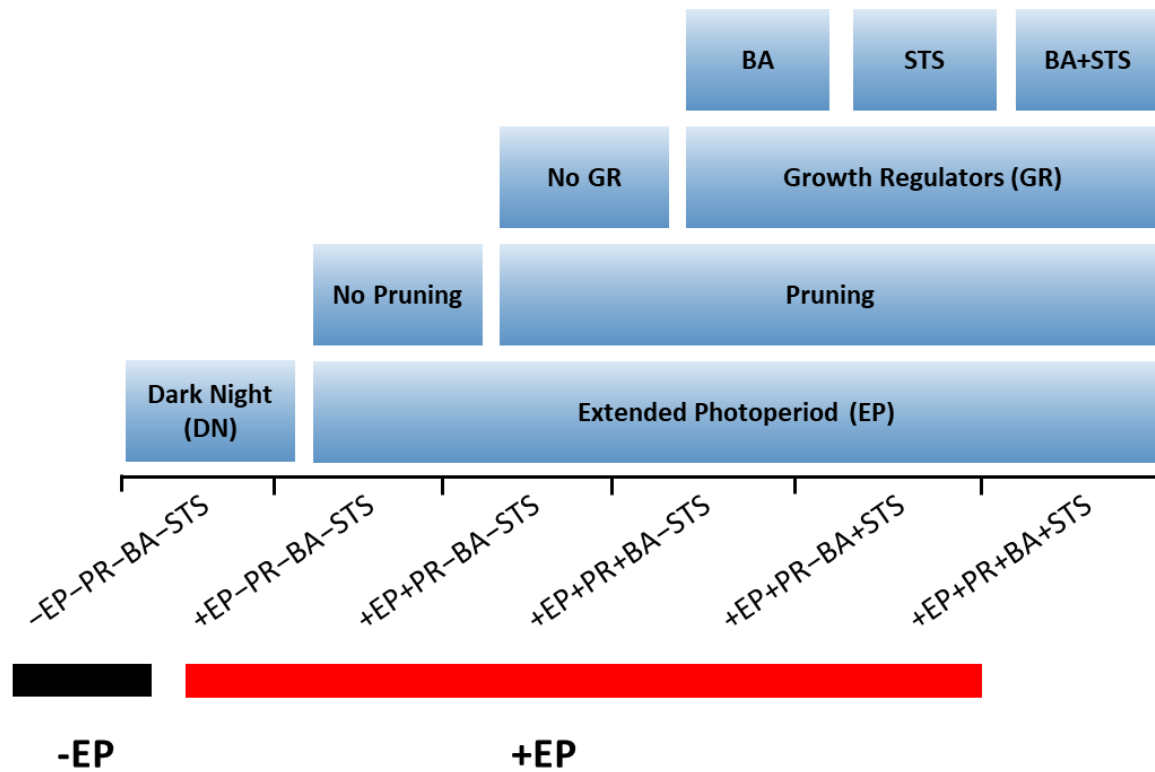


Figure 2. The six treatments with different components of the flower inducing technology. EP, Extended photoperiod; PR, pruning; BA, 6-Benzylaminopurine; STS, silver thiosulfate.

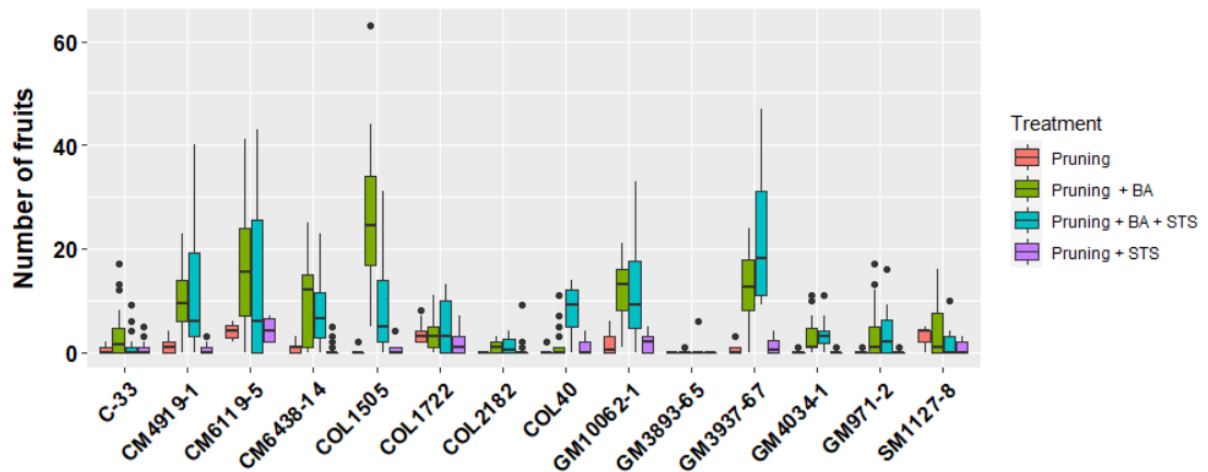


Figure 3. The effect of four treatments on the number of fruits in 13 breeding progenitors.