

DEVELOPMENT OF SUPERIOR SWEETPOTATO AND TARO VARIETIES WITH HIGH STARCH CONTENT AND QUALITIES

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Introduction

Sweetpotato and taro are both starch base crops. In the last 10 years, there has been an acute shortage of starch supply in Southeast Asian region for both food and industrial uses. Both sweetpotato and taro have potential for commercialisation and starch source in Malaysia. Sweetpotato is well adapted and its planting is well established since it was introduced into the country about 400 years ago. However, there was no superior high starch variety for both taro and sweetpotato. Our previous studies showed that most of the sweetpotato varieties in the country were for table use and contain less than 30% dry matter and low starch. This study was undertaken to develop sweetpotato and taro varieties with improved dry matter and starch contents.

Materials and Methods

Sweetpotato: Recurrent Polycross technique was employed. Two sets of polycrosses were set up namely Polycross I from local germplasm and the second from Polycross II from improved line provided by CIP-Bogor. The 20 parents from both polycrosses were planted in a polycross nursery using RCBD with 5 replications. They were arranged in such a way that in every replication all parents had different neighbours to enable each of them to cross with all the other parents. A total of 100 progenies from each parent were evaluated for dry matter, starch and agronomic and morphological characters. Evaluation processes involved 3 stages: single plant, row and replicated trials. The best progeny from each parent were used as parents for the next cycle of polycross. Concurrently

they were the progenies that were evaluated to produce varieties. **Taro:** Since not much has been done on taro, the project involved mainly collection and evaluation of taro genotypes from Malaysia. Collected germplasm were evaluated for morphological and agronomic characters, and dry matter and starch contents.

Results and Discussion

Sweetpotato: A total of 1600 progenies of Polycross I was evaluated in July 98 in a single plant trial. Consequently, 60 promising progenies were selected and advanced to single row trial. They are now being evaluated in a replicated trial. From 2000 progenies Polycross II evaluated in 1997, a total of 20 progenies was selected for high dry matter content (>30%) and starch content (>20% wet weight basis). The selected plants had semi-erect plant type, moderate leaf size and vigorous growth. All trials were set up with minimum maintenance to emulate farmer's condition. Under this situation only plants with high competitive ability will perform. The selected plants possess this ability. The second cycle of the Polycross is now being planted in the Polycross Garden.

Taro: Three collection missions were done from 1997-1998. A total of 186 accessions have been obtained, which it covered all taro areas in Peninsula Malaysia. During the last collection mission in August 1998, 143 accessions of taro were collected. The accessions have been planted in the field in August 1998, to examine the morphological characters, characteristics related to maturity, corn quality and shape of the crop. These collection have been analysed for morphological characters and they showed very wide variability in plant type and leaf characteristics.

Conclusions

After one cycle of polycross, the starch and dry matter of the new progenies were increased from an average of 15% and 25%, to >20% and 30% respectively. A total of 20 plants with high dry matter and starch content has been isolated for further polycross cycle. This study should be continued to develop a pool of high starch and dry matter sweetpotato. As for taro, the presence of wide variability provides an excellent opportunity for genetic improvement taro in Malaysia.