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A YAM COLLABORATIVE SELECTION PLATEFORM IN GUADELOUPE: A MODEL FOR EFFECTIVE MULTIPARTENARIAL AND PARTICIPATIVE PROGRAM

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Abstract

Since the early years of 2002, INRA and CIRAD in Guadeloupe have implemented complementary yam breeding programs to develop highly performant and locally well-adapted yam hybrids to fit both producers and consumer's requirements, yielding to nearly 20 pre-selected innovative cultivars.

In 2012, a multi-local, multi-partenarial and participative field plot network was implemented to achieve evaluation of cultivar performance at field scale in contrasted geographical and productive environments throughout Guadeloupe. During two to three crop cycles, several agronomic and qualitative indicators selected by producers were followed, registers and combined in a collaborative database. Once formatted, data will be used to develop computer-based decision tools to help growers and technical advisors with selection of best-adapted cultivars to specific growing production or final use.

Though this collaborative platform, various actors such as research scientists, breeders, technical advisors and producers have experimented and optimized effective yam breeding network to serve as a model for evaluation of any other tuber crops in Guadeloupe.

Materials and methods

Yam pre-selected cultivars were evaluated at the farm in 7 different contrasted yam-producing areas in Guadeloupe over 3 crop cycles, each approximately 10-to-12 months long. The list of cultivars, number of plants per cultivar (48), and distribution of cultivars within the experimental plot were pre-determined by the selection committee, and common to all experimental sites. Cultivation practices such as soil preparation, type and irrigation frequency, fertilization, choice for yam foliage support or associated crops were given free to each producer.

At each experimental site and for each crop cycle, several indicators were followed from planting to post-harvesting, as determined by the selection committee. Over 2 months after planting, number of germinated plants per cultivar was assessed bi-weekly and expressed as percent of germinated plants to assess germination rate and homogeneity. From 2 months after planting, foliage development rate per cultivar was determined by measuring weekly foliage soil covering in one-square-meter quadrats and expressed as quadrat total percent cover.

All along crop cycle, foliar diseases and disorders caused by anthracnose, curvularia or viruses were determined by evaluation of symptom intensity following a 1-to-5 scale.

At harvest and for each experimental site and each cultivar, number of yam tubers per harvested plant was determined and expressed as average number of plant tubers. Additionally, each harvested tuber was weighted individually and characterized regarding global shape and quality. Finally, weight and quality of lots of 7 tubers per cultivars were evaluated during 2 months after harvest to evaluate potential for post-harvest conservation.

At each crop cycle, several farm field-days were organized at selected experimental sites with producers and technical advisors located in the vicinity of the production site. Participants were invited to appreciate foliage development, cultivar estimated yield and tuber quality using evaluation sheets.

Main results

Over 3 crop-cycles and in 7 experimental sites, over 100.000 individual data were collected and combined. As for instance 8097, 8832 and 5103 yam individual tubers weights were collected in 2013, 2014 and 2015, respectively. All data are currently being processed to evaluate cultivar performance in contrasted and heterogeneous environments and determine if there are statistically significant cultivar-environment interactions. However preliminary results already suggest that yam cultivar variability within each experimental site is not significantly different to variability between experimental sites.

Conclusion

Yam selection cultivars though multiple criteria analysis in contrasted geographic and pedoclimatic environments with various cultivation practices appears to be a complex and tremendous process. Thus, selection of a limited number of highly successful cultivars adapted to all yam production areas and markets in Guadeloupe seems not to be the preferred strategy. Indeed, feedbacks from yam evaluation field days have reveled that any of the evaluated cultivars could fit one's growers or consumer's requirements, indicating that expectation for a range of multiple and various cultivars is greater than for limited selected cultivars. Through continuous enhanced interactions within the collaborative platform between final consumers and growers, on one side, and yam breeders and actors of the selective process, on the other site, these results should help improving yam selection process in Guadeloupe to deliver cultivars best fitting local requirements.