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**PROCEEDINGS
OF THE
CARIBBEAN FOOD CROPS SOCIETY**



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QUALITY IMPROVEMENT IN PLANTAINS BY SELECTION

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INTRODUCTION

The plantain production in Puerto Rico for the year 1970 amounted to 253 million fruits with a total farm value of 10.4 million dollars (1). This sum of production was derived from some 16,000 acres of land devoted to plantsins which are mainly small farms in the humid regions of Puerto Rico. The production has been increasing in recent year at the rate of about 3% annually with the existing varieties such as Harton, Guayamero, Enano, Maricongo, Congo Colorado and Congo Blanco. It is conceivable that many introductions for each of these varieties were made from various sources at different times, so they might be quite different genetically. Also since these introductions have been grown under different climatic and soil conditions for many years on the Island, new genetic variations might have occurred in the adapted strains. With these under consideration, we believe it is highly probable that these varieties can be successfully improved through clonal selection.

Our main objective is to select clones with high nutritive value, mainly the content of ascorbic acid and carotenoids and the pulp to peel ratio of the fruit. The preliminary results are reported here.

EXPERIMENTAL PROCEDURE

Clones of 6 varieties, Harton, Guayamero, Enano, Congo Blanco, Congo Colorado and Maricongo were collected from different climatic regions of Puerto Rico. Among these, Harton, Guayamero, and Enano are the most common varieties grown in the western part of the Island. The plantation was established in the College Farm in 1970. Fertilizer formula 9-10-5 was applied at the rate of 2 pounds per plant at 60 day intervals until shooting.

The bunches of plantains were harvested for chemical analyses in September 1971, 90-120 days after shooting. The fingers from the third hand of the bunch were used for determination of ascorbic acid (2), total carotenoids (3) and pulp to peel ratio. The chemical determinations were done in duplicates, each from a separate sample.

RESULTS AND CONCLUSION

The results indicate that great variability existed in the content of biochemical components under consideration, i.e., ascorbic acid and total carotenoids (Table 1). The differences observed in the clones of Harton, Guayamero, Enano and Congo Blanco were significant at 5% or 1% level for either ascorbic acid or for both ascorbic acid and total carotenoids by Duncan's Multiple Range Test (4). The clones of Maricongo and Congo Colorado showed no differences with respect to the vitamins under investigation. This might be due to the limited number of clones used in the study. The uncovering of clones in Harton and Guayamero rich in both ascorbic acid and total carotenoids is of special interest.

The pulp to peel ratio also showed differences in different clones of the varieties Harton and Enano.

These preliminary results seem to point to the conclusion that improvement of plantain quality can be achieved by clonal selection from the existing material on the island.

Additional collections for the top varieties Harton, Guayamero and Enano are being made to extend the bases for further selection studies. Also, materials from clones superior in vitamin C and vitamin A have been propagated for future analyses.

Table 1. Biochemical Determination of Ascorbic Acid and Carotenoids in Clones of 6 Common Plaintain Varieties

Variety	Clone	Ascorbic Acid mg/100 g. pulp	Clone	Total Carotenoids ug/g. pulp
Harton	F ₃	15.24 a*	F ₃	37.5 a
	F ₂	17.46 a	F ₂	41.5 a
	D ₂	23.17 b	D ₂	94.0 b
	D ₃	23.52 b	D ₃	132.5 b
Guayamero	C ₂	14.40 a	C ₂	80.0 a
	C ₄	21.42 b	C ₄	93.0 a
	A ₁	24.44 b	A ₁	128.5 b
Enano	F ₁	18.76 a	E ₄	115.5 a
	E ₄	19.52 a	A ₂	118.0 a
	F ₄	19.74 a	F ₁	125.0 a
	A ₂	21.34 b	E ₃	129.5 a
	F ₂	21.83 b	F ₄	132.5 a
	E ₁	22.68 b	E ₁	142.5 a
	E ₃	23.43 b	F ₂	132.5 a
Congo-Blanco	F ₃	21.01 a	F ₄	107.5 a
	F ₄	23.32 a	F ₁	137.5 a
	F ₁	24.33 b	F ₃	157.5 a
Maricongo	E ₃	18.74 a	E ₃	111.5 a
	E ₄	23.20 a	E ₄	119.0 a
Congo-Colorado	F ₄	21.52 a	F ₄	123.0 a
	F ₃	21.93 a	F ₃	125.0 a

* Any two means followed by the same letter are not significantly different by Duncan's multiple range test.

LITERATURE CITED

1. Agricultural Experiment Station 1971. Fact Sheet on Puerto Rico's Agriculture.
2. Gyorgi, P., 1950. Vitamin Methods, Vol. 1, Academic Press, Inc., New York, N. Y. pp. 266-7.
3. Official Methods of the Association of Official Agricultural Chemists, 10th ed., Washington, D. C., 1965.
4. Principles and Procedures of Statistics, McGraw-Hill Book Company, Inc., New York, N. Y., 1960, pp. 107-9.

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PROGRESS REPORT ON THE EVALUATION OF VARIETIES AND PLANTING DATES OF HEAD CABBAGE IN PUERTO RICO

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SUMMARY

Cabbage hybrids Market Prize, Market Topper, King Cole and Head Start, and the open-pollinated varieties Marion Market, Surehead and Stein's Early Flat Dutch were tested in the Isabela Agricultural Experiment Substation. A series of 12 monthly experiments with these group of cabbage varieties were conducted from October, 1970 to September 1971. Data on yield, average head weight, firmness and precocity were obtained from each variety and hybrid under test.

In general the hybrid varieties produced significantly higher yields of marketable cabbage than the open-pollinated varieties. The winter months and May tests gave significantly higher and better yields than the other months plantings.

The quality of the marketable yield of the hybrids, as measured by the firmness and the average head weight was better through the 12 experiments than the quality of the open-pollinated varieties.

The hybrids and varieties included in these tests were classified as early, intermediate and late according to the average number of days from transplant to harvest.