

Performance of Yam (*Dioscorea* spp.) Varieties in East-Central Puerto Rico¹

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ABSTRACT

The highest yielding yam cultivar in a yield trial planted at the Corozal Substation in east-central Puerto Rico was Seal Top (*Dioscorea alata*). It produced an estimated yield of 40.17 metric tons/ha (358.66 cwt/acre). The cultivar yielding least was Guinea amarillo (*D. cayennensis*) which produced 9.373 metric tons/ha (83.69 cwt/acre).

Besides producing high yield when compared with locally planted cultivars, the tubers of Seal Top, Barbados and Smooth Statia are ovoid without attached roots, thus suitable for mechanical harvesting. Farm Lisbon and Hunte tubers are bifurcate and unsuitable for mechanical harvesting. There is little local market demand for tubers of this type of yam.

INTRODUCTION

The production of yams in Puerto Rico during 1971-72 amounted to 14,834 metric tons (292,000 cwt.) with a farm value of \$4,088,000 (6). Local demand surpassed supply and production had to be supplemented with imports from the Dominican Republic. The evaluation of newly introduced varieties for pest resistance, yield potential and crop quality was undertaken due to the importance of the yam crop to the Puerto Rican economy.

The results obtained in a variety trial conducted at the Corozal Substation are reported in this paper.

MATERIALS AND METHODS

Nine yam cultivars were planted April 7, 1972 at the Corozal Substation in a randomized block design. The cultivars included in the trial were: Seal Top, Barbados, Smooth Statia, Farm Lisbon, Oriental, Hunte and Florido, all classified by Coursey (3) as *Dioscorea alata*, Habanero as (*D.*

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rotundata), and Guinea amarillo as (*D. cayennensis*). He described them as follows:

Seal Top—(*D. alata*). Cross-sections of stems of all *D. alata* cultivars show corners simulating wings. The name *alata* is derived from this characteristic. The leaves are small and heart shaped. The tubers are cylindrical to globular with no roots attached and with skin dark and flesh white.

Barbados—(*D. alata*) Heart shaped leaves. Tubers cylindrical to globular with very few roots attached, skin dark and flesh white.

Smooth Statia—(*D. alata*). Medium sized ovate leaves. Cylindrical tubers either single or double with smooth surface and free of roots. Flesh is cream colored with a grainy appearance.

Farm Lisbon—(*D. alata*). Medium sized ovate leaves. Tubers borne singly or as several lower half branched, having an appearance of a baseball glove. Surface with few roots attached and flesh white.

Oriental—(*D. alata*). Leaves small sized and heart shaped. Typically ovoid tubers with very few roots, thick skin and white flesh.

Hunte—(*D. alata*). Medium sized leaves which usually have pointed basal lobes. Tubers usually are free from roots, generally bifurcated at half their length to form two or more large so-called fingers. It has a cream colored skin and white flesh.

Florida—(*D. alata*). Leaves are arrowshaped, with a deep basal sinus, and dark green color. Long cylindrical tubers are free of roots. Flesh is white to light cream with a granular appearance.

Habanero—(*D. rotundata*). Round stems with spines on the axils of the leaves. The vines generally are long and vigorous with glossy, tough and very dark green heart-shaped leaves. Cylindrical tubers with a smooth surface and a grayish brown color; flesh white.

Guinea amarillo—(*D. cayennensis*). Small and very strong vines, round stems; pointed, tough, glossy and very dark green leaves. Looks very much like Habanero. The tuber also resembles Habanero in shape and size, but the flesh is yellow.

Each plot was 8 × 10 feet with two rows of plants spaced at 1 foot between plants (1,2). All plots were fertilized with the equivalent of 1,120 kg/ha of a 12-6-16 fertilizer. All plants were staked (5).

The experiment was conducted on a Corozal clay (Ultisol). The plots were harvested when the vines were dry January 15, 1973 nine months after planting.

RESULTS AND DISCUSSION

Data on the performance of the various yam cultivars are given in the following tabulation:

<u>Cultivars</u>	<u>Yield per hectare</u>
	(metric ton)
<i>Dioscorea alata</i>	
Seal Top	40.17a ³
Barbados	39.02a
Smooth Statia	37.58a
Farm Lisbon	31.10a b
Oriental	29.04a b
Hunte	21.57 b c
Florida	15.70 c
<i>Dioscorea rotundata</i>	
Habanero	23.63 b c
<i>Dioscorea cayennensis</i>	
Guinea amarillo	9.37

Highly significant differences occurred between mean yields of some of the yam cultivars. Within the *D. alata* series, there were no significant differences between cultivars Seal Top, Barbados, Smooth Statia, Farm Lisbon and Oriental. Yields of these were significantly higher, however, than those obtained from Florida. The yields of the *D. alata* cultivars, Seal Top, Barbados, and Smooth Statia were significantly higher than those of the species Habanero (*D. rotundata*) and Guinea amarillo (*D. cayennensis*). Although the yields of Habanero (*D. rotundata*) were higher than those of Florida (*D. alata*) the mean differences between the two, which are the recognized commercial cultivars used in Puerto Rico, were not significant. The highest yield was obtained from Seal Top (*D. alata*), 40.170 metric tons/ha (358.66 cwt/acre), while the lowest yield was obtained from Guinea amarillo (*D. cayennensis*), 9.373 metric tons/ha (83.69 cwt/acre).

As previously noted, the tubers of the high yielding cultivars, Seal Top, Barbados and Smooth Statia are ovoid and without attached roots. The tubers are not exceedingly large and are easily harvested without breaking them. These characteristics are commercially desirable and facilitate the mechanical harvesting of the crop. The tubers produced by Farm Lisbon and Hunte are bifurcate and are unsuitable for mechanical harvesting.

Yields obtained from Seal Top, Barbados and Smooth Statia (*D. alata*) are relatively high when compared to those generally obtained locally (4).

The high yields obtained in this experiment and the desirable characteristics of the tubers of Seal Top, Barbados and Smooth Statia cultivars suggest the possibility of growing them commercially in areas similar to Corozal.

³ Values in the vertical column followed by the same letters are not significantly different at $P = 0.01$.

RESUMEN

En la Subestación de Corozal se sembró un experimento donde se probaron nueve cultivares de ñame (*Dioscorea* spp.). De éstos, siete pertenecían a la especie *alata* (Seal Top, Barbados, Smooth Statia, Farm Lisbon, Oriental, Hunte, Florido), uno a la especie *rotundata* (Habanero) y uno a la especie *cayennensis* (Guinea amarillo). Entre los cultivares probados el de más alto rendimiento fue Seal Top (*D. alata*) con una producción de 40.17 toneladas métricas por hectárea, (358.66 q/acre) y el de más bajo rendimiento Guinea Amarillo (*D. cayennensis*) con una producción de 9.37 toneladas métricas por hectárea, (83.69 q/acre).

Además de ser buenos productores, los cultivares Seal Top, Barbados y Smooth Statia tienen un tubérculo de forma ovoide y de cáscara lisa, el cual ofrece muy buenas perspectivas para la cosecha mecanizada. Los tubérculos de los cultivares Farm Lisbon y Hunte son bifurcados, lo cual los hace indeseables para la cosecha mecanizada al igual que para el mercado.

Las producciones obtenidas con los cultivares Seal Top, Barbados y Smooth Statia (*D. alata*) son relativamente altas, cuando se comparan con las obtenidas por los agricultores locales usando los cultivares Florido (*D. alata*) y Habanero (*D. rotundata*), que son los que más se siembran comercialmente en Puerto Rico.

LITERATURE CITED

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