



"Serie INIVIT Dorada": three elite sweet potato cultivars (*Ipomoea batatas* [L.] Lam) with orange flesh and high β -carotene content

"Serie INIVIT Dorada": tres cultivares élite de boniato (*Ipomoea batatas* [L.] Lam) de pulpa anaranjada con alto contenido de β -caroteno

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ABSTRACT: "Serie INIVIT Dorada", comprising three sweet potato cultivars 'INIVIT Dorado-2', 'INIVIT Dorado-4' and 'INIVIT Dorado-6', is presented. These genotypes were developed through controlled hybridizations between elite parents of Chinese, Peruvian and Cuban origin. The genotypes were selected through a recurrent selection scheme that included evaluation in F₁ and C₁ generations, and multi-environment trials across 13 locations in Cuba. The cultivars exhibit uniform elliptical-shaped roots, smooth skin, absence of morphological defects, homogeneous size (200-400 g), and orange flesh with high β -carotene content (>450 ppm). Additionally, they show excellent phenotypic stability and adaptation to Cuban edaphoclimatic conditions.

Key words: plant breeding, root quality, β -carotene, phenotypic stability.

RESUMEN: Se presenta la "Serie INIVIT Dorada", conformada por tres cultivares de boniato: 'INIVIT Dorado-2', 'INIVIT Dorado-4' e 'INIVIT Dorado-6', obtenidos mediante hibridaciones controladas entre parentales élites de origen chino, peruano y cubano. Los genotipos fueron seleccionados a través de un esquema recurrente que incluyó evaluación en generaciones F₁ y C₁, y ensayos multiambientales en 13 localidades de Cuba. Los cultivares presentan raíces de forma elíptica uniforme, piel lisa, ausencia de defectos morfológicos, calibre homogéneo (200-400 g) y pulpa anaranjada con alto contenido de β -caroteno (>450 ppm). Adicionalmente, exhiben excelente estabilidad fenotípica y adaptación a las condiciones edafoclimáticas de Cuba.

Palabras clave: mejoramiento genético, calidad de raíces, estabilidad fenotípica.

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INTRODUCTION

The export potential of sweet potato is limited by the scarcity of varieties that combine high productivity with the demanding quality standards of the international market: smooth skin, uniform shape, homogeneous caliber, and nutritious orange flesh. To fill this gap, the "Serie INIVIT Dorada" was developed. This paper presents the origin and characteristics of the three cultivars that comprise it ('INIVIT Dorado-2', '-4', and '-6'), elite genotypes created specifically for the Premium export market.

ORIGIN AND DESCRIPTION

The "Serie INIVIT Dorada" was obtained through a conventional breeding program that used parents of

Chinese, Peruvian, and Cuban origin. From controlled biparental crosses, 19 full-sib families were generated, initially evaluating 1732 *seedlings* in the field. The selection scheme included four stages: visual F₁ selection, clonal evaluation (C1), advanced trials with replicates, and genotype × environment interaction studies (Figure 1).

The three cultivars share a superior commercial quality profile and high productive efficiency (3-5 commercial roots per plant, caliber 200-400 g). Their adaptability and phenotypic stability were confirmed through AMMI and GGE biplot analysis in 13 locations, which showed low genotype × environment interaction (IPCA1 close to zero and WAASB < 1.5) (Figure 2) (Table 1).

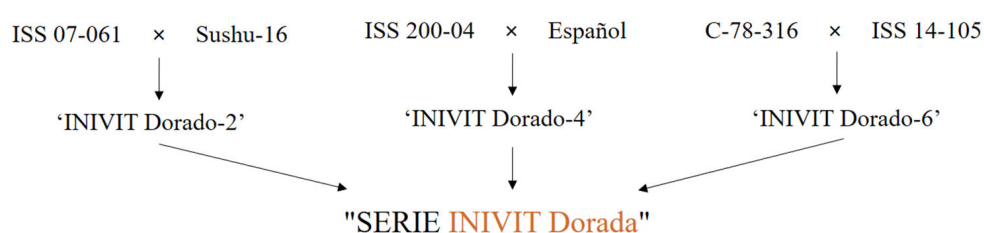


Figure 1. Pedigree of the 'Serie INIVIT Dorada' cultivars

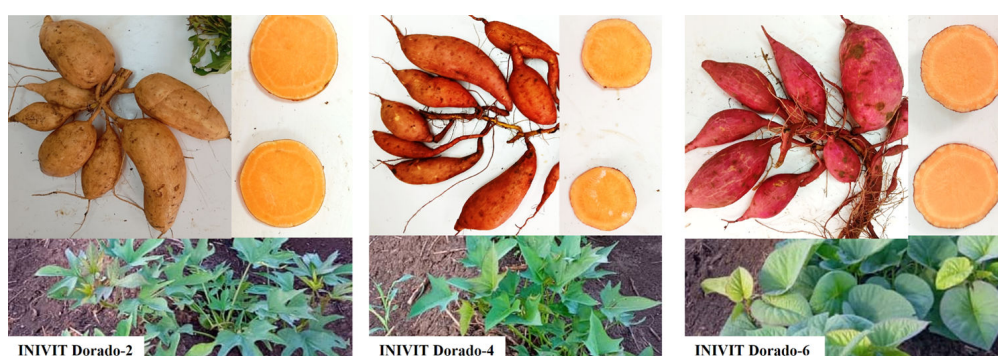


Figure 2. Tuberous roots, pulp, and foliage of the 'Serie INIVIT Dorada'

Table 1. Agronomic and quality characteristics of the 'Serie INIVIT Dorada' cultivars

Characteristics	INIVIT Dorado-2	INIVIT Dorado-4	INIVIT Dorado-6
Yield (t ha ⁻¹)	24.8 ± 2.1	28.3 ± 1.8	32.6 ± 2.4
Number of roots/plant	3-4	4-5	4-5
Size / Caliber (g)	200-350	250-400	250-400
Dry matter (%)	29.5 ± 1.2	30.5 ± 1.4	28.8 ± 1.1
β-carotene (ppm)	450 ± 25	520 ± 30	480 ± 28
Stability (WAASB)	1.2	1.0	1.4
Cycle (days)	120	120	130