

New sweetpotato cultivars from INIA's breeding project in Uruguay

Vicente, C.E.^{1*} Rodríguez, G.² Vilaró, F.² Pereira, G.³ Spina, W.¹ Picos, C.³ González, M.¹

¹ Instituto Nacional de Investigación Agropecuaria, INIA Salto Grande, Cno. al Terrible s/n, Salto, Uruguay, * Corresponding author, evicente@sg.inia.org.uy

² Instituto Nacional de Investigación Agropecuaria, INIA Las Brujas, Canelones, Uruguay

³ Instituto Nacional de Investigación Agropecuaria, INIA Tacuarembó, Tacuarembó, Uruguay

Abstract:

Sweetpotato ranks second among vegetable crops in Uruguay. This is a very traditional consumption product with the widest country coverage and largest number of growers. It is planted mainly for fresh marketable use as a seasonal crop. 60% of production is obtained in the south and 30% in northwest regions. The most widely planted, is represented by 'INIA Arapey', released in 1998. This "boniato" type cultivar is distinguished by its thick purple skin, cream flesh and semihumid texture after cooking. Secondarily, there is an increasing preference for orange cultivar types with humid texture, represented mainly by 'Beauregard'.

Main objectives of INIA's sweetpotato breeding activities would be the development of adapted cultivars resistant to main pests for diverse market uses and with good storability. Four promising sweetpotato cultivars have been developed recently. 'N0401.3' is a medium early variety (3 to 4 months), copper skin, orange flesh, good storability, reduced soil insect damage. It could over yield 'Beauregard' in the northern region. 'K9818.1' is a main season cultivar (4 to 5 months), copper skin, deep orange flesh and very good flavor. It could over yield 'Beauregard' in the southern region. 'H9430.23' is a main season cultivar (4 to 5 months), deep red skin, cream flesh, good storability, reduced soil insect damage. Last, 'K 9807.1' is another main season genotype (4 to 5 months) cream skin and flesh with very good storability. Because of its higher dry matter (30%) it is mainly recommended for processing purpose (flour, alcohol) and feeding.

Keywords: *Ipomoea batatas*, clones, orange flesh, purple skin, dry matter.

Introduction

Uruguay Sweet potato crop ranks second on planted area and first in growers number. It is a very traditional crop, having very wide country coverage. It is mainly grown as a cash crop for fresh domestic consumption. Harvest season extends from January to June, whereas annual availability is supported through rustic stores for up to 6 months. Main production specialized areas are located at South (60%) and North (30%) supplying capital major market. Other scattered production, mainly in the Northeast, supplies smaller cities. This last crop is grown more extensively and self consumption is quite common.

'INIA Arapey' is the main planted cultivar, country wide (Vicente et al 1999). It is a purple skin, yellow flesh and semi humid texture, most commercially preferred root type ("Boniato"). It is a medium season cultivar (100 to 120 days) with medium storing ability (3 to 4 months). More recently, there is a growing demand for orange flesh humid textured cultivars because of taste preferences and health considerations (high beta carotene content). 'Beauregard' and local cultivars: 'INIA Ayuí', 'INIA Itapebí', 'E 9227.1' supplies this demand (Rodríguez et al 2007).

INIA's crop improvement project general objective is the development of pest resistant cultivars, adapted to local growing conditions and diverse market types and uses (Vilaro et al 2005). Moreover, sweet potato specific breeding objectives would be the development of adapted cultivars with improved storing ability. Recurrent selection method through half sib polycross families is been routinely performed for over 20 years. More recently, three breeding populations were assembled for fulfilling diverse requirements. Preliminary clonal selection is performed in two cycles (North) or one (South) per year. Advanced clones are evaluated collaboratively through comparative trials conducted by three Experimental Stations (Salto Grande, Las Brujas and Tacuarembó) located at North, South and Northeast. Performance of most promising clones is validated at farm level by participatory evaluation at each region.

In this article four new cultivars developed by the project are presented. They cover various market types and adaptation to specific production regions in the country.

New developed cultivars

'Ñ 0401.3'

This cultivar was developed from 2004 polycross. Seed bed sprouting is medium, earlier than 'Beauregard' and planting vigor is good. Foliage vigor is larger than 'Beauregard' and vine length is medium. Growth cycle is early to very early (90 to 120 days), adapted to early and or late planting date. Productivity is high, superior than 'Beauregard', similar to 'INIA Ayui' and 'INIA Arapey'. Root shape is fusiform, medium to large size, rosy smooth skin, light orange flesh and high marketable grade. Insect soil damage (*Chaectocnema sp.*) is smaller than 'Beauregard'. It shows humid texture and taste is good to very good, surpassing 'INIA Ayui'. It has very good storing ability, similar to 'Beauregard', larger than 'INIA Ayui' and 'INIA Arapey'. This cultivar is a large improvement in comparison to other orange flesh sweet potato available cultivars for Uruguay northern region.

'K 9818.1'

This cultivar was developed from 1998 polycross. Seed bed sprouting is medium, earlier than 'Beauregard' and planting vigor is good. Foliage vigor is larger than 'Beauregard' and vine length is medium. Growth cycle is medium to medium late (120-150 days). Productivity is high, higher than 'Beauregard'. It produces regular fusiform shape roots, medium size, smooth copper skin, deep orange flesh with very high carotene, doubling 'Beauregard' content (50 mg/100 g fresh weight). Insect soil damage (*Chaectocnema sp.*) is smaller than 'Beauregard' in heavy soil. It shows humid texture and taste is very good. It has a good storing ability, similar to 'Beauregard'. This cultivar is a large improvement in comparison to other main season orange flesh sweet potato available cultivars for southern region. It also grows well on northern heavy textured soils.

'H 9430.23'

This cultivar was developed from 1994 polycross. Seed bed sprouting is very good and planting vigor is good. Foliage vigor is very good and vine length is medium. Growth cycle is medium to medium late (120-150 days). Productivity is equal or larger than Arapey. It produces regular fusiform shape roots, medium size, smooth red to purple skin, cream flesh. Taste is good with semi humid texture. Insect soil damage (*Chaectocnema sp.*) is low. Storing ability is quite good, longer than 'INIA Arapey'. This cultivar is a large improvement in comparison to other main season "boniato" type available cultivars for Uruguay northeast region.

'K 9807.1'

This cultivar was developed from 1998 polycross. Seed bed sprouting is very good and planting vigor is very good. Foliage vigor is quite high with medium to long vines. Growth cycle is medium to medium late (120-150 days). Productivity is similar to Arapey. It produces regular round fusiform roots, large size, cream skin and flesh. Insect soil damage (*Chaectocnema sp.*) is low. Taste is quite unsweet with semi dry texture. Dry matter is estimated over 30%, surpassing most cultivated varieties. Storing ability is quite good, longer than 'INIA Arapey'. This cultivar has a wide country adaptation being a large improvement for processing and animal feed types.

Literature cited

- Rodríguez, G. Vilaró, F. Vicente, E. Pereira, G. 2007. Mejoramiento genético de boniato: resultados y perspectivas. SUFH, XI Congreso de Hortifruticultura, mayo 2007, Montevideo. <http://www.inia.org.uy/online/site>.
- Vicente, E.; Vilaró, F.; Spina, W.; Picos, C.; Rodríguez, G. 1999. Investigación y desarrollo de una nueva variedad de Boniato para el Litoral Norte del país con proyección nacional: INIA Arapey. In: VII Congreso Nacional de Horticultura. Montevideo, 1999, Montevideo. Resúmenes del VII Congreso Nacional de Horticultura. Montevideo, Junio de 1999.
- Vilaró, F.; Vicente, E.; Giménez, G. ; Pereira, G.; Rodríguez, G.; Cabot, M.; Manzoni, A.; Spina, W.; Picos, C.; Dallarizza, M.; Castillo, A.; Maeso, D. 2005. Desarrollo y conservación de germoplasma mejorado en especies hortícolas para Uruguay. . In: V Simposio de Recursos Genéticos para América Latina y el Caribe, 2005, Montevideo. Agrociencia 2005: Volumen Especial.