

Non-sweet or Staple Type Sweet Potatoes

Franklin W. Martin

*Tropical Agriculture Research Station, Agricultural Research Service,
U.S. Department of Agriculture, Mayaguez, Puerto Rico*

The typical sweet potato is not necessarily sweet before cooking. It contains 4–20% nonreducing sugar, chiefly sucrose, and 1–10% reducing sugars, principally fructose, on a dry weight basis (5). During cooking, part of the starch is hydrolyzed to maltose and dextrins by β amylase (2). The sucrose content, on the other hand, is not affected by cooking, except that boiling may remove part of it.

In searching for low-sweet or even non-sweet sweet potatoes I have found recently a number of clones (4), some of which will be eventually released as new cultivars, that are low in sweetness or that are non-sweet to most palates. These clones came either from seeds introduced from the Solomon Islands through Peter Linton or from seeds originating in polycrosses of low-sweet, sweet

potatoes in Mayaguez, Puerto Rico. The purpose of this note is to inform other horticulturists of the existence of such sweet potatoes and some of their properties, as potential cultivars to replace the Irish potato in the hot, humid tropics, where production is difficult.

So far, more than 100 very low-sweet or non-sweet selections have been made. They were identified in routine laboratory taste tests after previous selection in the field. Not all of these have been retained, however, as most were discarded because of other inadequacies. Data from the best clones are included in Table 1, and about 20 other clones are still under investigation. Reducing and non-reducing sugars of freshly harvested storage roots, before and after 20 min of boiling, were measured by techniques of the Official Analytical Chemists (3). These data were collected over a 2-year period from several trials and are based on six or more analyses. Amylase activity was determined on acrylamide gel by methods of Brewbaker et al. (1).

Clones, as seen in Table 1, are of several

types. The cultivar Gem was used for comparison, a typical orange-fleshed sweet type in which cooking increases reducing sugar content. The clones SPV 52, SPV 63, SPV 70, and SPV 71 exhibit no or very low β -amylase activity. In these clones, reducing sugars did not increase on cooking (boiling) or increased only slightly. Two clones with low β -amylase activity, SPV 60 and SPV 62, were still slightly sweet after cooking due to high nonreducing sugar content. The clone SPV 61 has low sugar content with high β -carotene.

It should now be possible to produce very acceptable, potato-like sweet potatoes (termed "staple type" sweet potatoes). SPV 70 'Margarita' approaches that goal.

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Table 1. Sweetness and content of reducing sugars and non-reducing sugars before and after cooking (dry weight basis), and β -amylase activity in eight sweet potato clones.

Clone or cultivar ²	Sweetness	Range of reducing sugars (g/100 g)		Range of nonreducing sugars		β -amylase activity
		Before cooking	After cooking	Before cooking	After cooking	
Gem	5	5.2–8.9	23.6–29.0	13.2–18.0	12.9–16.5	5 ³
SPV 52 (Ninety-nine)	0	0.6–3.2	0.07–4.1	4.4–5.7	5.2–6.0	1
SPV 62 (Sahara)	1	2.2–5.0	2.2–5.8	7.8–13.3	7.6–13.5	2
SPV 65 (Mojave)	0	2.8–4.7	3.0–6.9	4.7–5.3	4.6–5.8	2
SPV 70 (Margarita)	0	2.0–2.9	2.2–3.5	2.3–2.9	2.0–2.9	0
SPV 71 (Tapat6)	0–2	3.9–5.2	3.6–5.7	3.0–6.2	3.1–5.8	0
SPV 60 (Limonette)	1–2	3.0–3.9	3.2–6.3	11.2–14.5	10.5–12.6	2
SPV 61 (Bugsbunny)	0	3.3–5.6	3.2–4.1	2.2–4.7	3.0–4.8	0

²Gem is a standard sweet cultivar used for comparison.

³Sweetness was judged from low (0) to high (5).

³ β -amylase activity was measured from not detected (0) to high (5).