Release of Six Sweetpotato Cultivars ('NASPOT 1' to 'NASPOT 6') in Uganda

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Six sweetpotato breeding lines, 'NASPOT 1' ('Namulonge Sweetpotato 1'), 'NASPOT 2', 'NASPOT 3', 'NASPOT 4', 'NASPOT 5', and 'NASPOT 6', were approved for release by the Ugandan Plant Variety Release Committee in Feb. 1999. This is the second lot of sweetpotato cultivars to be officially released by the sweetpotato program in Uganda, the first being released in 1995 (Mwanga et al., 2001). All six cultivars have good storage root shapes, high dry matter content, excellent consumer acceptance (Tables 1 and 2), moderate to high levels of field resistance to sweetpotato virus disease (SPVD), and high storage root yields compared to the average national root yield of 4 t·ha⁻¹ (International Potato Center, 1999). The release of these six cultivars provides consumers and farmers with improved quality sweetpotatoes of white, yellow, and orange flesh color.

Origin

During evaluation at the Namulonge Agricultural and Animal Production Research Institute (NAARI), Namulonge, Uganda,

the six released cultivars were designated as follows (in parenthesis): 'NASPOT 1' Namulonge *Ipomoea* selection [(NIS)/91/52], 'NASPOT 2' (NIS/91/178), 'NASPOT 3' (NIS/91/218), 'NASPOT 4' (NIS/91/282), 'NASPOT 5' (NIS/91/316), and 'NASPOT 6' (NIS/91/324). They were selected from bulked seed from an open-pollinated polycross nursery of 24 parents made in 1991 at NAARI. The 24 parents in the polycross block consisted of six cultivars released in 1995, seven popular farmer cultivars (landraces), five advanced clones from the Ugandan sweetpotato breeding program, and three introductions from the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. 'Sowola', from the Namulonge breeding program, and the landrace cultivars Bwanjule, New Kawogo, Tanzania, Tororo 3, and Wagabolige were released in Uganda in 1995 on the basis of their superior performance and consumer acceptance (Mwanga et al., 2001). They were included in the polycross block on the basis of field resistance to SPVD, high root yield (≥ 20 t·ha⁻¹ on-station), high dry matter content of storage roots ($\geq 30\%$), and good taste. The seven popular farmer landrace cultivars were 'Kanziga 1' (high yielder, susceptible to SPVD) from Jinja District, 'Old Kawogo' and 'Kyebandula' (high dry matter content and excellent taste) from Mpigi District, 'Sulaoluti' (early maturing, susceptible to SPVD) from Jinja District, 'Bikilamaliya' (good taste, susceptible to SPVD) from Kasese District, 'Mulerabana' (resistant to *Alternaria* stem blight, adapted to high altitude, susceptible to SPVD) from Kabale, and 'Bitambi' (high dry matter content) from Luwero District. The introductions from IITA were used as sources of high dry matter (clone TIS

2498), and orange flesh (high beta carotene) (clones TIS 9101 and TIB 4). Because of open pollination and seed bulking, the individual parents and pedigrees of the released cultivars are unknown.

Description and performance

Details of important standard morphological descriptors [International Potato Center (CIP), Asian Vegetable Research and Development Center (AVRDC), and International Board for Plant Genetic Resources (IPBGR), 1991] of the six cultivars are listed in Table 1. Important quality attributes, disease and insect pest reactions, and horticultural traits are presented in Table 2. All six cultivars have spreading vines and vigorous growth with dense foliage that suppresses aggressive weeds. The flower color in all the six cultivars is the same, pale purple limb with purple throat. Flowering, capsule formation, and seed set are sparse in 'NASPOT 1'; moderate in 'NASPOT 2', 'NASPOT 3', and 'NASPOT 6'; and profuse in 'NASPOT 4' and 'NASPOT 5', enabling crosses to generate breeding populations under NAARI conditions without special treatment.

All of these materials have high storage root dry matter content (29% to 35%), a dry texture, and a slightly sweet flavor when cooked. Flesh color ranges from white to orange, with intensity varying slightly according to location and season.

The released cultivars were tested for 10 seasons on-station and on-farm during 1993–98 in replicated, multi-location yield trials in: 1) the warm, sub-humid short grasslands where weevils and drought are important; 2) the warm, moist, tall grasslands where viruses are severe; and 3) the cool, moist, southwestern highlands where *Alternaria* stem blight and low soil fertility problems are widespread. The cultivars were routinely evaluated for resistance to sweetpotato virus disease (SPVD), *Alternaria* stem blight, and sweetpotato weevils, *Cylas puncticollis* (Boheman) and *C. brunneus* (Fabricius) (Table 2). Classifications of the relative resistance to disease and insect damage were based on field evaluation under natural disease pressure and insect populations with the level of infection varying from low to high depending on agroecology. Storage root dry matter content, root yield, taste and desirable agronomic attributes (e.g., earliness, root size, shape, and stability of root traits) were also evaluated (Table 2). All the released cultivars have field resistance to SPVD at NAARI where high natural SPVD inoculum pressure is prevalent, but none are immune when graft-inoculated with the disease. Although the six cultivars vary in susceptibility to sweetpotato weevils under field conditions, they are all highly susceptible in no choice tests under laboratory conditions. They are, however, potentially valuable as sources of resistance to sweetpotato virus disease and *Alternaria* stem blight in a high dry matter content background, and they have already been distributed by CIP to several countries in Sub-Saharan Africa.

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Table 1. Morphological descriptors of six sweetpotato cultivars ('NASPOT 1' to 'NASPOT 6') released in Uganda in Feb. 1999.^z

Descriptor	Cultivar					
	NASPOT 1	NASPOT 2	NASOT 3	NASPOT 4	NASPOT 5	NASPOT 6
Plant type	Spreading	Spreading	Spreading	Spreading	Spreading	Spreading
Predominant color	Green	Green	<i>Vine pigmentation</i>		Green	Green
Secondary color	Absent	Purple tip	Dark purple tip	Purple tip	Absent	Absent
General outline	Lobed	Lobed	<i>Mature leaf shape</i>		Lobed	Deeply lobed
Lobe type	Moderate	Moderate	Deep	Moderate	Deep	Very deep
Lobe number	5	5	7	5	5	7
Shape of central lobe	Semi-elliptic	Elliptic	Elliptic	Triangular	Lanceolate	Linear (narrow)
Pigmentation	Green	Green	<i>Abaxial leaf vein</i>		Green	Green
Foliage color	Green	Green	Green	Green	Green	Green
Mature leaf color	Green	Green	Green	Green	Green	Green
Immature leaf color	Green with purple edges	Moderately purple	Mostly purple	Slightly purple	Green	Green
Petiole pigmentation	Green	Green	Green	Green	Green	Green
Shape	Obovate	Obovate	<i>Storage root</i>		Round elliptical	Obovate
Surface defects	Absent	Absent	Absent	Absent	Longitudinal veins	Absent
Predominant	Cream	Purple	<i>Skin color</i>		Cream	Cream
Intensity	Dark	Dark	Cream	Purple	Dark	Pale
Secondary	Absent	Absent	Intermediate	Dark	Absent	Absent
Predominant	Pale yellow	Cream	<i>Flesh color</i>		Orange	White
Secondary	Absent	Absent	Cream	Pale yellow	Absent	Absent
			Purple tint	Absent		

^zSelected descriptors according to CIP, AVRDC, and IBPGR (1991).

Table 2. Yield quality attributes and disease and insect pest reaction of six sweetpotato cultivars released in Uganda in Feb. 1999.

Attribute	Cultivar						
	NASPOT 1	NASPOT 2	NASPOT 3	NASPOT 4	NASPOT 5	NASPOT 6	Tororo 3
Dry matter (%)	33	29	35	33	30	34	31
Cooked texture	Dry	Dry	Dry	Dry	Dry	Dry	Somewhat dry
Sweetness	Sweet	Sweet	Sweet	Sweet	Sweet	Sweet	Moderate
Field reaction to weevils ^z	S	S	MR	MR	MR	MR	MR
Field reaction to SPVD ^{z,y}	MR	R	R	R	MR	MR	MR
Field reaction to Alternaria stem blight ^z	S	S	R	S	R	R	S
Maturity (days)	Medium (120–150)	Medium (120–150)	Late (130–150)	Late (130–150)	Medium (120–150)	Medium (120–150)	Medium (120–130)
Mean and (range ^a) of storage root yields in various yield trials (t·ha ⁻¹)	29 (9–61)	21 (8–42)	25 (7–52)	21 (7–39)	23 (7–47)	24 (7–64)	18 (5–52)
Mean storage root yield (% of Tororo 3, common check cv.)	161	117	139	117	127	133	100

^zSusceptible (S) = considerable damage or numbers present to severe damage or very high numbers present, respectively. Moderately resistant (MR) = moderate damage or moderate numbers present. Resistant (R) = no apparent damage or no insects present.^ySPVD = sweetpotato virus disease.^aThe wide variation in yield is attributed to variation in environmental factors such as erratic rain during some seasons, and differences in soil types in the different agroecologies.

Availability

The cultivars are maintained as pathogen-tested plants in the screenhouse at the Kenya Quarantine Station, Muguga, Kenya, and are maintained in the field by NAARI in Uganda. Requests for these cultivars should be addressed to: Seed Unit, CIP, P.O. Box 25171, Nairobi, Kenya. Requests for planting

materials within Uganda should be directed to: Sweetpotato Program, NAARI, P.O. Box 7084, Kampala.

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