

Sweetpotato (*Ipomea batatas* var. *batatas*) Cultivars Evaluated on Hawaii Island for Yield, Resistance to Pests, and Quality



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ABSTRACT

Ten sweetpotato accessions/ cultivars were evaluated for yield, resistance to pests, and quality in field trials in Pepeekeo, Hawaii. Thirty cuttings of each accession/ cultivar were planted at a spacing of 0.3 m in a hill that was 1.5 x 9.1 m and blocked over time due to limited availability of space. In the first two field trials, local cultivars planted were Okinawan, Mokauau, and Kona B, as well as accessions 531094, 566613 (Beauregard), 573309, 573330, 595199 (Darby), 634398 (Pelican Processor), and 634399 (Picadito). Yields of 'Mokauau' and 'Kona B' were too low and they were replaced in the latter three field trials with two new cultivars from Louisiana State University Agricultural Center (Murasaki-29 and LA 08-21p). Five trials were planted on May 2014, October 2014, February 2015, 15 July 2015, and January 2016. Plots were harvested from 4.5 to 6 months after planting. Storage roots were graded according to State of Hawaii standards, and categorized as Grade AA, A, B, and off-grade. Marketable yields combined storage roots in Grades AA, A, and B. In addition, injuries of storage roots in each category were estimated due to infestations of sweetpotato weevil [*Cylas formicarius elegantulus* (Coleoptera: Brentidae)]. Finally, sugar concentrations, anthocyanins, and β-carotene contents were measured in storage roots. Accessions/ cultivars differed significantly in marketable fresh weight yields, with 'LA 08-21p' having the greatest marketable yields. However, 'LA 08-21p' also had the greatest incidence of damage due to weevils, perhaps due to its growth habit of a tight cluster of storage roots located close to the soil surface. Accessions/ cultivars also differed significantly in sugar concentrations (fructose, glucose, sucrose, maltose, and total sugars). Concentration of sucrose was highest among mono- and di-saccharides analyzed and ranged from 25 to 68 mg gfw⁻¹. 'Beauregard' had the highest sucrose concentration and total sugars. Purple-fleshed cultivars (Okinawan and LA 08-21p) contained total monomeric anthocyanins that ranged from 34 to 37 mg 100 gdw⁻¹. Orange-fleshed cultivars (Beauregard and Darby) contained β-carotene that ranged from 5485 to 8302 ug 100 gfw⁻¹. Results from these field trials demonstrate healthful benefits of purple-fleshed and orange-fleshed sweetpotato cultivars, as well as provide yield information to growers interested in producing new cultivars.

MATERIALS AND METHODS

Table 1. Planting date, harvest date, and sampling date for quality measurements.

	Block 1	Block 2	Block 3	Block 4	Block 5
Planting date	5/8/14	10/1/14	2/25/15	7/15/15	1/12/16
Harvest date	10/3/14	2/18/15	7/16/15	1/12/16	7/19/16
Sample for Quality	0	0	0	X	X



Figure 1. 'LA 08-21p' (red-skinned, purple fleshed) harvested on 7/19/16. It formed tight clusters of storage roots near the soil surface.



Figure 2. 'LA 08-21p' harvested on 7/19/16 and graded into AA, A, B (marketable), and off-grade.

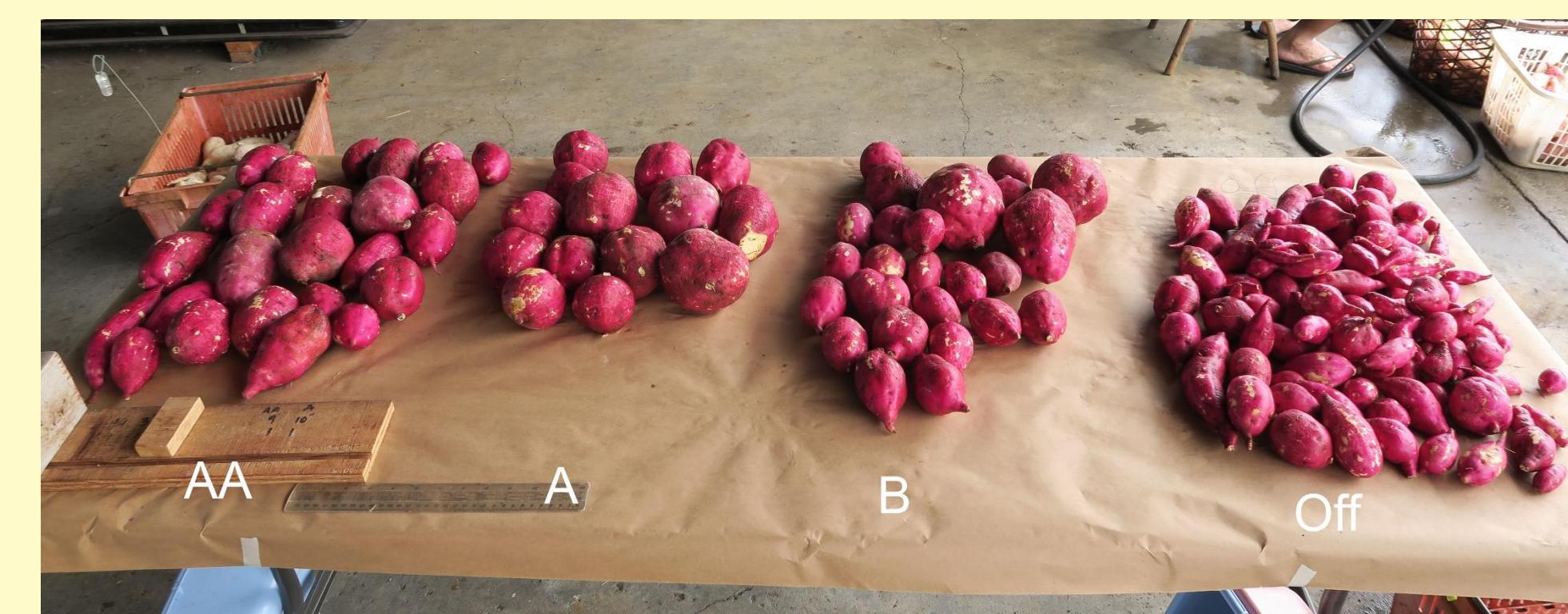


Figure 4. 'Murasaki-29' harvested on 7/19/16 and graded into AA, A, B (marketable), and off-grade categories.

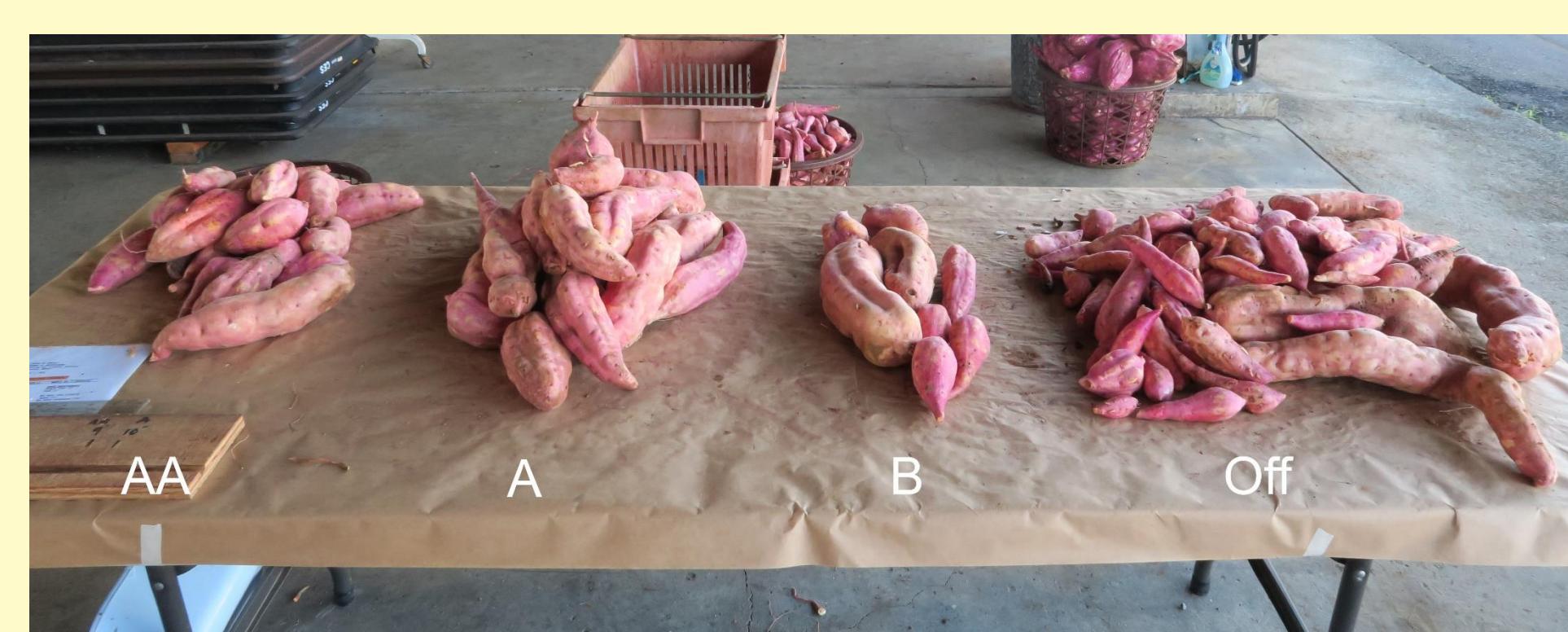


Figure 3. Accession 566613 'Beauregard' harvested on 7/19/16 and graded into AA, A, B (marketable), and off-grade.



Figure 5. Left, 'LA 08-21p' in consumer acceptance trial; Right, accession 566613 'Beauregard'.

Table 2. Concentrations of sugars (fructose, glucose, sucrose, maltose, and total) in 10 sweetpotato accessions/ cultivars. Means followed by the same letter are not significantly different at 95% probability level.

Accession/ Cultivar	Fructose, mg/gfw	Glucose, mg/gfw	Sucrose, mg/gfw	Maltose, mg/gfw	Total Sugars, mg/gfw
Okinawan	0.77 f	2.50 f	50.03 c	0.44 b	53.29 cd
Murasaki-29	0.51 g	2.58 f	56.28 b	0.77 ab	59.96 b
LA 08-21p	4.70 c	11.78 c	38.59 fg	0.57 ab	52.40 cde
531094	6.81 b	14.27 ab	36.25 g	0.80 ab	52.18 cde
566613/ Beauregard	3.04 d	7.19 d	68.38 a	0.51 b	76.88 a
573309	1.43 ef	4.00 ef	46.84 cd	1.07 a	52.41 cde
573330	8.47 a	16.23 a	25.29 h	0.49 b	45.18 f
595199/ Darby	7.49 b	13.89 b	38.78 efg	0.70 ab	55.74 bc
634398/ Pelican Processor	2.07 e	5.24 de	43.78 ed	0.58 ab	50.28 def
634399/ Picadito	1.75 e	4.02 ef	42.48 def	0.53 b	47.79 ef

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