Proc. Fla. State Hort. Soc. 134:177. 2021.

—Scientific Note—

Determining Optimal Handling Conditions and Shelf Life for Orange- and Purple-fleshed Sweetpotatoes: Preliminary Studies

Merce Santana[1], Steven Sargent[1]*, Adrian Berry[1], David Dinkins[2], Wendy Mussoline[3], and Guodong Liu[1]

[1]*Horticultural Sciences Department, University of Florida, IFAS, Gainesville, FL*

[2] *University of Florida, IFAS, Florida Cooperative Extension Service, Gainesville, FL*

[3] *Putnam County Extension Center, University of Florida, IFAS, East Palatka, FL*

Additional index words. anthocyanins, ascorbic acid, carotenoids, curing, storage

Some Florida farmers are planting alternative crops like sweetpotato to diversify their operations. Since consumers are demanding healthier, nutrient-rich foods in their diets, the purple-fleshed sweetpotato has potential as a high-value crop with suitable growing conditions in the Florida climate. Sweetpotato roots are dug mechanically which can cause damage that leads to postharvest losses due to moisture loss, unmarketable appearance and disease. Curing is a low-cost postharvest technique that is applied prior to storage to maintain quality by enhancing starch to sugar conversion, suberization (wound healing) and skin set. However, improper curing conditions can lead to excessive sprouting and increased weight loss, which renders the roots unmarketable. Although harvest and handling techniques have been developed for orange-fleshed cultivars, recommendations for purple-fleshed cultivars are needed. For this study, the objective was to measure key quality parameters of purple-fleshed and orange-fleshed sweetpotato cultivars as affected by curing conditions and storage time.

Orange-fleshed 'Covington' sweetpotatoes were hand dug at the University of Florida/IFAS Hastings Agricultural Extension Center and purple-fleshed 'Charleston Purple' sweetpotatoes were mechanically dug from a commercial farm, both 150 d after planting, and transported to the University of Florida for storage and quality analyses (Fig. 1). Sweetpotatoes from each cultivar were stored either uncured at 15 °C (59 °F) and 85% relative humidity (RH) for 3 months or first cured for 7 d at 29 °C (84 °F) and 90% RH then transferred to 15 °C (59 °F) for the remaining total of 3 months. Evaluations were conducted after 0, 7, 28, 57, and 84 days for sprouting, decay, pulp color, moisture content, soluble solids content (SSC, °Brix), and nutritional quality (total anthocyanins, carotenoids, ascorbic acid).

Decay was < 8% for both cultivars during storage. However, 'Charleston Purple' developed significantly more sprouting than 'Covington'. Sprouting for cured 'Charleston Purple' was 54% and for uncured was only 6%, while 'Covington' had no sprouting regardless of curing treatment. Pulp color remained unchanged during storage for both treatments for 'Covington' (mean hue* angle = 60°) and for 'Charleston purple' (mean hue* angle = 350°). Initial moisture content was lower for 'Charleston Purple' (68%) compared to 'Covington' (75%) and decreased slightly for both cultivars during storage. Initially, soluble solids content was similar between cultivars (9.4 °Brix) but increased to 11.4 °Brix in 'Covington' after 3 months storage. Ascorbic acid content was higher in 'Charleston Purple' (70 mg/100 g) compared to 'Covington' (18 mg/100 g) and decreased slightly during storage. As expected, 'Charleston Purple' had higher anthocyanin (3.3 mg/100 g) and lower carotenoid content (0.1 mg/100 g) when compared with 'Covington' in which anthocyanins were not detectable and carotenoid content was 4.3 mg/100 g. The results from this study are comparable to previous reports for both sweetpotato types; however, the sprouting that occurred during the curing period of 'Charleston Purple' should be investigated further. Future studies are planned to evaluate the potential of several purple-fleshed cultivars for Florida production related to curing, sprouting and quality during storage in order to provide detailed recommendations.

Fig. 1. 'Charleston Purple' (left) and 'Covington' (right) sweetpotatoes.

This research was supported by the St. Johns County Extension Demonstration and Research Project. The authors acknowledge Mr. Gary England (former director, Hastings Agricultural Extension Center) and Mr. Danny Johns (Blue Sky Farms, Elkton) for their collaboration and contributions.

*Corresponding author. Email: sasa@ufl.edu