



Harvest Yields for Sweet Corn Variety Trial In Northeast Florida

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Sweet corn is a popular commodity. It currently has the highest harvested acreage among all of the vegetables grown in Florida. In an attempt to expand sweet corn production in Florida, a sweet corn variety trial was conducted in northeast Florida at the University of Florida/IFAS Hastings Agriculture Extension Center (HAEC) in Spring 2020. Eight bi-color varieties including ‘Superb MXR’, ‘Seminole Sweet XR’, ‘Obsession’, ‘Affection’, ‘Everglades’, ‘BSS-1075’, ‘BSS-8021’, and ‘CSABF13-698’ were planted from seed on 2 March 2020 in Hastings. The seeds were planted on one acre in a randomized complete plot design with four replications on 40-inch rows with 6.125 inches interrow spacing. Harvest yields among the eight varieties ranged from 316–437 crates/acre (assuming 48 ears/crate). The difference between the lowest yielding variety (‘BSS-8021’) was significantly different from the highest yielding variety (‘Affection’). The varieties with the highest percentage of ears that graded as U.S. Fancy after husked were ‘Everglades’ (90%), ‘Affection’ (86%) and ‘Superb MXR’ (83%). Continued efforts will be made to invigorate growers in northeast Florida to grow sweet corn and to establish appropriate planting strategies, variety selection, and market windows for this commodity.

Preserving agricultural land use in Florida is necessary for food and economic security, however, natural resources dedicated to farming are often targeted by developers. Vegetable cropping systems must continually evolve into sustainable, productive, and efficient land-use systems in order to maintain their place in rural Florida. New annual cropping schemes that incorporate high-value commodities are necessary for Florida to keep a competitive edge with other high productivity states. In the most recent Census of Agriculture, Florida ranked 5th in vegetable harvested acres after California, Idaho, Washington, and Wisconsin (USDA, 2017). Currently, sweet corn is the top producer among all vegetable commodities in Florida with 41,000 harvested acres in 2018 (USDA, 2019).

The Tri-County Agriculture Area (TCAA) in northeast Florida consists of St. John’s, Putnam, and Flagler Counties. The primary cash crops are potatoes and cabbage. Sweet corn is a valuable commodity with a relatively short season that can boost economic viability as a secondary cash crop and increase land use efficiency if integrated strategically. Growers could integrate small acreage plots into their annual cropping scheme without losing any opportunities provided by their standard cash crop. Large commercial growers typically stagger their planting dates so with some strategic planning, they could incorporate sweet corn without any overlap of their primary cash crop. Cabbage growers, for example, could dedicate small acreage plots from

their early cabbage to grow sweet corn in the spring, while potato growers could use plots dedicated to late potatoes for sweet corn plantings in the fall (see Fig. 1).

Research is currently underway to determine ideal planting dates for both spring and fall plantings of sweet corn in the TCAA. The goal of this project was to determine the most appropriate varieties to grow in the sandy soils commonly found in the TCAA.

Month	Potato Grower	Cabbage Grower
Jan	Potato	Cabbage
Feb	Potato	Cabbage
Mar	Potato	Sweet Corn
Apr	Potato	Sweet Corn
May	Potato	Sweet Corn
June	Cover Crop	Cover Crop
July	Cover Crop	Cover Crop
Aug	Cover Crop	Cover Crop
Sept	Sweet Corn	Cabbage
Oct	Sweet Corn	Cabbage
Nov	Sweet Corn	Cabbage
Dec	Potato	Cabbage

Fig. 1. Proposed Annual Crop Rotation Scheme for Incorporating Sweet Corn

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Specific objectives were to 1) identify days to maturity for each variety grown in a specific season and climate; 2) measure total harvest yields and grading quality for each variety; and 3) measure average weights of the ears, both husked and unhusked.

Materials and Methods

SWEET CORN PLANTING. Field experiments were conducted using eight different commercial bicolor sweet corn varieties grown during Spring 2020 at the Hastings Agriculture Extension Center. The seeds were provided by four different companies as shown in Table 1. They were planted in raised beds using a 4-row Monosem vacuum planter on 40-inch centers with an in-row spacing of 6.1 inches, resulting in a planting density of 25,602 plants per acre (A). Four replications of each variety were planted in a randomized complete block design. Each subplot consisted of four 100-ft rows. Sweet corn was planted in seepage irrigation fields on 2 Mar. 2020, with a total planted area of 0.84 A. The nutrient scheme consisted of a preplant application and three side dressings totaling 200 N–50 P–200 K (lb/A). Specifics associated with soil preparation, irrigation and management of pest, weeds and diseases followed standard grower practices.

SWEET CORN HARVEST AND EVALUATION. The harvest date was determined for each variety based on visual field observations such as kernel fill and plumpness as well as texture and taste. At harvest, the primary (top) ears in the central 30-ft of the middle two rows in each subplot were picked by hand, counted and weighed to get the total unhusked weight. A 30-ear subsample for each subplot was husked, weighed (husked weight) and graded as Fancy. Fancy ears were well-trimmed, well-developed, and free from decay, disease, and insect damage (USDA, 1992). We assigned all husked cobs that were well-covered, filled with plump, milky kernels and ≥ 6 in long as Fancy. Results were statistically analyzed using ANOVA followed by mean separation using Tukey’s HSD test at $P < 0.05$.

Table 1. Participating seed companies and their affiliated sweet corn varieties.

Seed Company	Affiliated Varieties
Seminis	Affection, Obsession
Crookham	Everglades, CSABF13-798
Illinois Foundation Seeds Inc.	Seminole Sweet XR, Superb MXR
Syngenta	BSS-1075, BSS-8021

Results and Discussion

Weather conditions were optimum for crop development in this location. Daily air temperatures were predominantly within the optimum range for growth (60 to 80 °F). Daily high and low air temperatures as well as rainfall events during the growing season were obtained from the Florida Automated Weather Network (FAWN) station located on-site and are shown in Fig. 2. Air temperatures dipped into the upper 30s shortly after planting, however, the high temperatures averaged 76 °F during the first 7 d. Minimal rainfall was recorded during the first 30 days after planting (DAP). Weekly rainfall events accumulated 2.4 in of rain during the rest of the growing season. The earliest variety, ‘Superb’, was harvested 72 DAP and all remaining varieties were harvested 77 DAP.

UNHUSKED EVALUATIONS. Total harvest yields for each variety in crates per acre are shown in Fig. 3 (assuming 48 ears/crate). The graphical depiction of results for unhusked evaluations incorporates all four replications for each variety except for ‘Superb’ and ‘CSABF13-698’, which are based on the average of three replications. The fourth subplots for these varieties were planted along a tree line and results were dismissed since most of the ears were decimated by raccoons. While ‘Affection’ had the highest average yield (437 crates/A) and the lowest variance among all four replications, there was no significant difference among the top producing 7 varieties. ‘Affection’ did have a significantly higher yield than ‘BSS-8021’. However, ‘Affection’ had

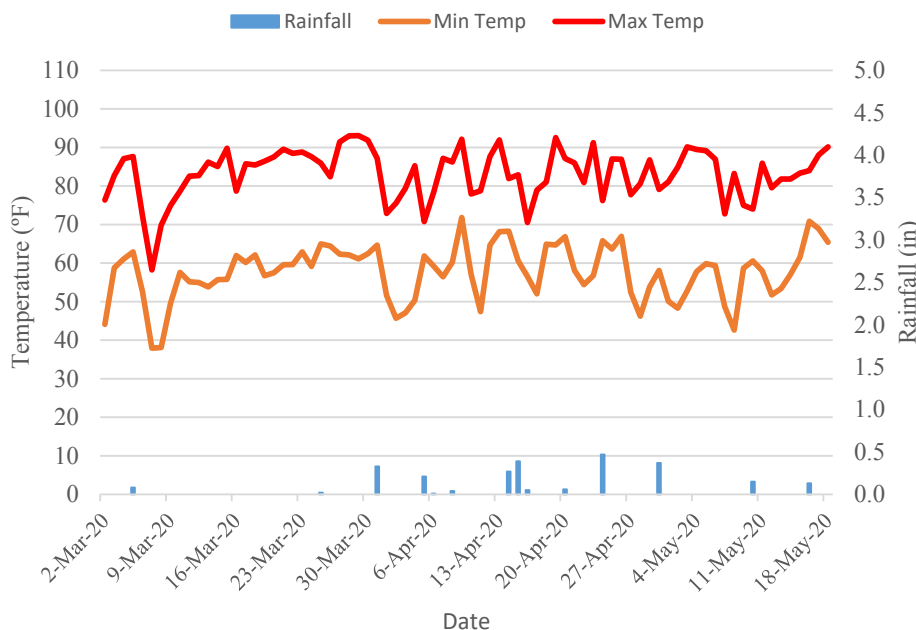


Fig. 2. Daily Minimum and maximum air temperature and rainfall events recorded by the Florida Automated Weather Network station in Hastings, FL.

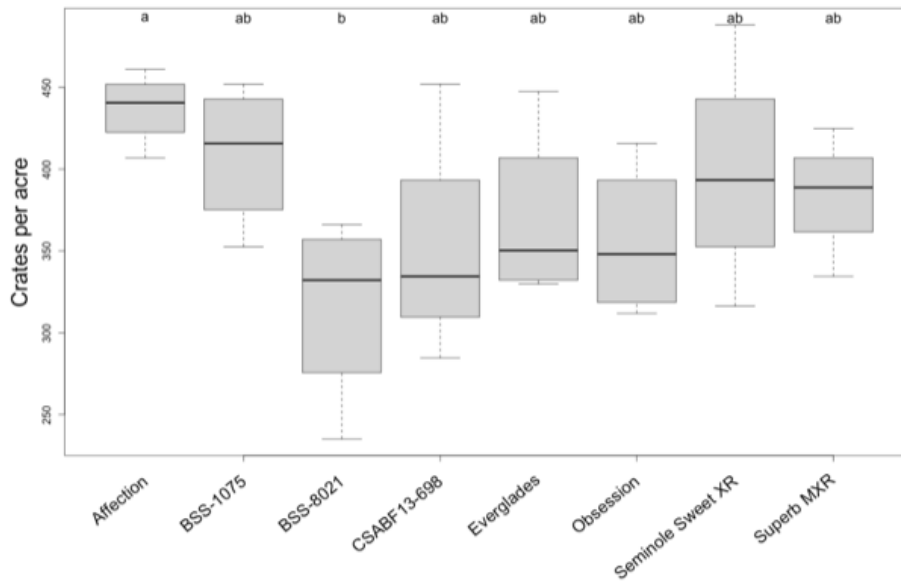


Fig. 3. Total marketable yields represented as crates per acre (letters on top represent significant differences according to the Tukey test at the 0.05 confidence level). Four replications are included for all varieties, except 'Superb' and 'CSABF13-698' where three replications are represented.

the lowest average unhusked per ear weight indicating that the ears and/or kernels were smaller than the other varieties (Fig. 4).

HUSKED EVALUATIONS. The average husked weight ranged from 0.19–0.65 lb/husked ear. 'BSS-1075' and 'Affection' had significantly lower average weight/husked ear (Fig. 5). The two hybrids from Crookham, 'Everglades' and 'CSABF13-698', had the highest per husked ear weight, although these were not significantly different from 'Obsession', 'SuperbMXR', 'Seminole Sweet XR', or 'BSS-8021'. The percentage of the husked ears that graded Fancy for each variety are shown in Fig. 6. Although there were no significant differences among the varieties in regard to Fancy grades, 'Affection' and 'Everglades' had the highest

average of Fancy grades and ear quality was consistently high among all four replications for these two varieties.

Conclusion

Although 'Affection' and 'BSS-1075' had the highest average harvest yields, there was no significant difference among the top seven varieties. Both 'Affection' and 'Everglades' were noted for their consistency in producing top grade or 'Fancy' ears and also for their excellent eating quality. Further research is planned that will expand the variety trials and provide data from multi-year cropping seasons in both the TCAA and selected sites in southern Georgia. Ideal planting dates within the TCAA need to be established for both spring and fall planting seasons.

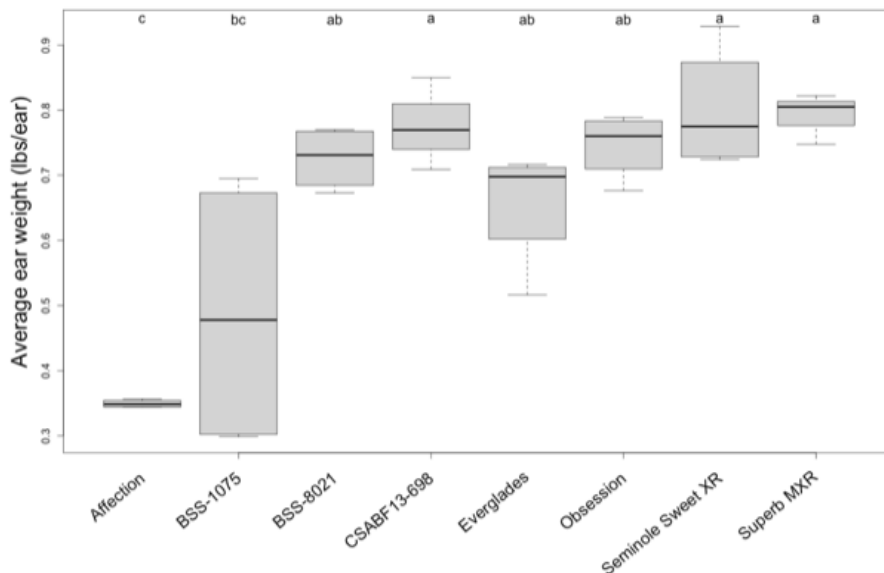


Fig. 4. Average unhusked ear weights (letters on top represent significant differences according to the Tukey test at the 0.05 confidence level).

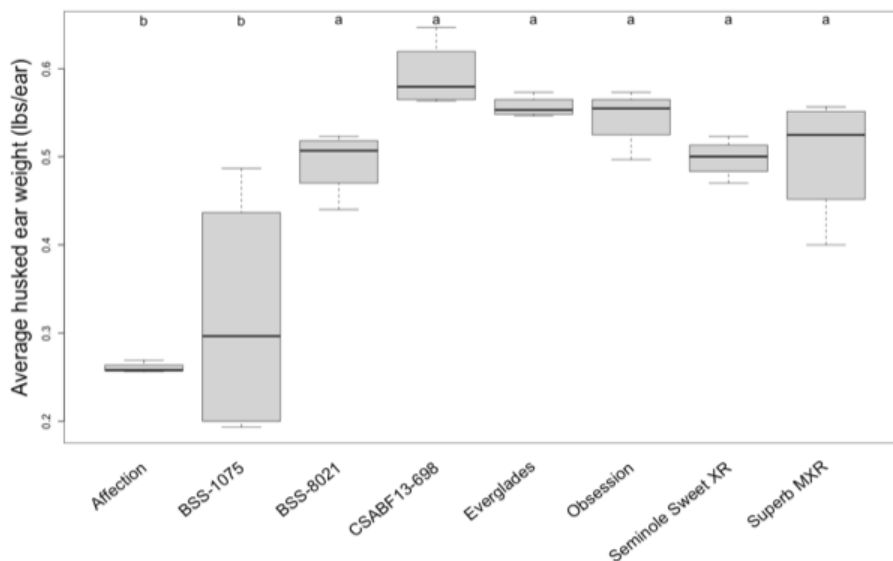


Fig. 5. Average husked ear weights (letters on top represent significant differences according to the Tukey test at the 0.05 confidence level).

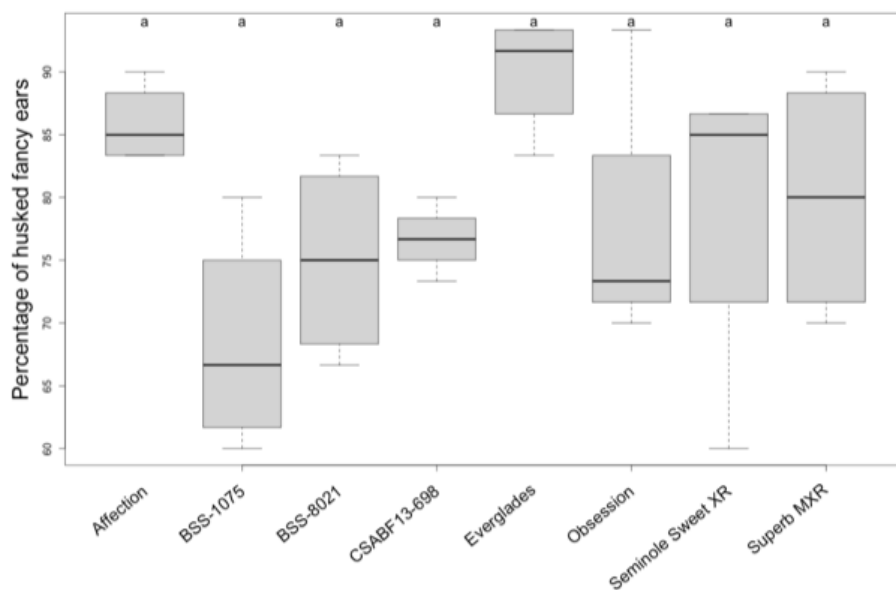


Fig. 6. Percent of husked ears rated as fancy grade according to USDA standards (letters on top represent significant differences according to the Tukey test at the 0.05 confidence level).

The ultimate goal of this research is to determine the most successful planting strategy for sweet corn in north Florida and to invigorate farmers in the TCAA to grow this commodity as a secondary cash crop behind cabbage in the spring or before potatoes in the fall.

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