

Sweet Corn Plant Population Study

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Introduction

Two fresh market sweet corn cultivars, Alto and BC 0805, were seeded at four different planting rates to observe how plant density affects yield, ear size, and tip fill.

Materials and Methods

The trial was conducted on a Fruitfield sand soil with 1.6 percent organic matter. The ground was prepared for planting by chisel plowing and disking. Normal cultural practices were followed for fertilization and pest control. Overhead irrigation was supplied to supplement rainfall and prevent drought stress. Syngenta supplied two sweet corn hybrids for this study: Alto, 72-day maturity hybrid, and BC 0805, 82-day maturity hybrid. Sweet corn seed was planted approximately 1.25 in. deep with a John Deere 7000 planter with finger pick-up seed meter units. Planter settings were chosen to slightly overplant to obtain desired final stands of 14,000, 20,000, 26,000, and 32,000 plants/acre. Stand counts were taken and plots were hand thinned if needed. Trial design was a randomized complete block with three replications. Plots consisted of six rows, spaced 30 in. apart, and 40 ft long. Data were collected from the center two rows of each plot. Alto treatments were planted on April 29 and harvested on July 16. BC 0805 treatments were planted on April 29 and harvested on July 26.

Results and Discussion

Large variations exist in recommendations for optimum plant population for fresh market sweet corn. Typically, recommendations fall in the 16,000 to 24,000 plants/acre range but can vary by as much as 12,000 to 28,000 plants/acre. These wide differences are partly due to a lack of published research on

optimum planting density with today's hybrids and also on the growers' need for high quality ears for marketing. To insure large ear size, good appearance, and kernels filled to the tip of the ear, growers often plant sweet corn at a low plant population to minimize stress on developing ears. On the other hand, disadvantages of low plant populations limit income and waste crop input resources.

This study looked at two hybrids, Alto and BC 0805, established at four populations of 14,000, 20,000, 26,000, and 32,000 plants/acre to observe effects on yield and ear quality. Results are presented in Tables 1 and 2. It is obvious cultivar selection is a primary determinant of ear size since Alto consistently had smaller ears than BC 0805 at all plant populations. As expected, plant population had a direct effect on yield. As plant population increased, so did the number of marketable-sized ears and total weight harvested. Because sweet corn is sold by the ear, this means maximum income is achieved at the highest plant population still capable of producing marketable-quality ears. In these plantings, as population/acre increased from 14,000 to 32,000, the average weight of individual ears and the average ear diameter decreased. Average ear lengths were not affected as much by plant population, and it was only at the highest plant population of 32,000 that a slight decrease in ear lengths was measured. Tip fill was affected at the higher populations of 26,000 and 32,000 by an increase in percentage of ears rated as fair or poor.

These observations were conducted on a sandy soil with irrigation and showed that under these conditions plant populations between 20,000 and 26,000 plants/acre were optimum for achieving high yield while maintaining good ear size and quality.

Table 1. Effect of plant population on marketable yield, ear size and tip fill for Alto harvested July 16.

Plants per acre	Plants market ears ¹ (%)	Dozen ears/acre	Yield cwt/acre	Husked ear wt (oz)	Ear length (in.)	Ear dia. (in.)	Tip fill ears good ² (%)	Tip fill ears fair ² (%)	Tip fill ears poor ² (%)
14,000	97	1,131	89.6	6.6	7.0	1.75	100	0	0
20,000	98	1,633	119.5	6.5	6.9	1.73	100	0	0
26,000	94	2,036	141.7	6.4	6.9	1.71	97	3	0
32,000	91	2,426	154.3	5.9	6.7	1.67	75	18	7

¹Percent plants producing marketable ear at least 6 in. long with well-filled kernels.

²Tip fill: Good = less than ¼ in. unfilled kernels in tip; Fair = ¼ to 1 in. of unfilled kernels; Poor = more than 1 in. unfilled kernels.

Table 2. Effect of plant population on marketable yield, ear size, and tip fill for BC 0805 harvested July 26.

Plants per acre	Plants market ears ¹ (%)	Dozen ears/acre	Yield cwt/acre	Husked ear wt (oz)	Ear length (in.)	Ear dia. (in.)	Tip fill ears good ² (%)	Tip fill ears fair ² (%)	Tip fill ears poor ² (%)
14,000	93	1,085	108.1	9.5	8.7	1.84	100	0	0
20,000	92	1,533	156.4	9.4	8.6	1.83	100	0	0
26,000	86	1,803	172.2	9.3	8.6	1.81	82	14	4
32,000	81	2,160	189.2	8.6	8.5	1.78	70	17	13

¹Percent plants producing marketable ear at least 6 in. long with well-filled kernels.

²Tip fill: Good = less than ¼ in. unfilled kernels in tip; Fair = ¼ to 1 in. of unfilled kernels; Poor = more than 1 in. unfilled kernels.