The Connecticut Agricultural Experiment Station, New Haven

Bicolor Supersweet Corn Trials 1995-1996

BY DAVID E. HILL

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SUMMARY

In 1995 cultivar evaluation trials, six cultivars of bicolor supersweet corn (sh2) were grown in early-June (Crop 1) and early-July (Crop 2) at Windsor in a sandy terrace soil and at Mt. Carmel in a loamy upland soil. In 1996 germination trials, the same cultivars were grown at both sites in three May plantings using clear plastic mulch and Reemay row cover to warm the soil.

In the cultivar evaluation trials, average yield in Crop 1 at Windsor was 16,700 ears/A compared to 11,845 ears/A at Mt. Carmel. In Crop 2 at Windsor, average yield was 13,830 ears/A. In Crop 1, yield of Confection, highest among all cultivars, was 23,845 ears/A at Windsor and 16,995 ears/A at Mt. Carmel. High yield of Confection was due to high germination rate (72-75%). In Crops 1 and 2 at Windsor, high yield of Summer Sweet 8102 (19,660 and 20,530 ears/A, respectively) was due to high average yield/plant (2.2 ears).

In all crops at both sites, Eagle, a late-maturing cultivar, had the longest (7.9 in.) and heaviest (8.4 oz.) ears among all cultivars. Its median number of rows was 16 but 30% of ears had 18 rows. The germination of Eagle (untreated seed), however, was poor. Although the ears of Summer Sweet 8102 at Windsor were slightly smaller than Eagle, they had excellent husk cover and the greatest percent in Grade 1 (72). In Crop 1 at Mt. Carmel, the ears of Top Notch were somewhat longer and heavier than they were at Windsor. At Windsor, however, Grade 1 ears exceeded 75% compared to 22% at Mt. Carmel due to incomplete tip fill.

In germination trials, the earliest planting at Windsor, May 14, with clear plastic mulch, increased germination of Confection, Summer Sweet 8102, and Sweet Heart over 20% compared to the untreated controls. Reemay row cover increased germination of Confection and Top Notch over 20% compared to untreated controls. In the May 13 planting at Mt. Carmel, clear plastic mulch increased germination of Top Notch and Skyline 3-17% and Reemay 13-25% at both sites, respectively. In the May 20-21 and May 27-28 plantings, few increases in germination were observed in any cultivar with clear plastic mulch or Reemay row cover. Profound decreases in germination in all cultivars were observed in the May 27-28 planting at both sites in plots covered with clear plastic mulch. Seeds were killed when subjected to temperatures exceeding 125F on sunny days.

Management strategies are discussed to maximize yield through cultivar selection and the use of clear plastic mulch and Reemay row cover in early plantings. Although net profits increased by the use of clear plastic mulch and Reemay row covers in all plantings at both sites, except the May 27-28 planting under clear plastic at both sites, neither cover produced a net profit greater than the untreated control. In the May 14 planting at Windsor, both covers on Confection and Summer Sweet 8102 produced a high enough yield, compared to the control, to offset the cost of material and labor if sold at $3.00/dozen ears retail. At $1.50/dozen ears wholesale, net profits were always greater in untreated controls compared to either cover. Clear plastic mulch and Reemay row covers increase yield, but the increase did not offset the increased production cost, except at a higher wholesale price.

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Sweet corn, an herbaceous grass, (*Zea mays* var. *saccarata*) is highly prized in the United States and is a vegetable staple throughout the year. Sweet corn is eaten on the cob "in season". In winter, frozen and canned corn is often supplemented by fresh corn grown in frost-free areas in Florida.

The earliest corn was grown in North America before 2000 BC and was referred to as Indian corn or maize (Splittstoesser 1979). Sweet corn, believed to be a mutation of field corn, was grown by Indians and adopted by pioneers late in the 18th Century. Constant improvement of varieties by geneticists created more than 2000 hybrids.

There are three genetic categories of sweet corn. The normal sugary varieties (su) have total sugar content in the endosperm less than 10%, the sugar enhanced varieties (se) about 18%, and the supersweet varieties (sh2) more than 30% (Laughnan 1953). The supersweet varieties, containing the shrunken2 gene, not only have high sugar content, but the conversion of sugar to starch after full maturity is retarded (Creech 1965). These two factors enable harvested mature supersweet corn to retain sweetness at least 10 days under refrigeration. In normal types, the sugar is mostly converted to starch within 2-3 days. Southern sweet corn growers have benefited from the development of supersweet corn because they can now ship their corn to distant markets without significant loss of sweetness and flavor. For northern growers and their customers, the benefits of supersweet varieties are obvious. The highest sugar content occurs about 24 days after silk has formed in about half the plants (Creech 1965). After 24 days, the harvest window for the grower is broader than for normal corn without loss of quality. If harvest occurs when the sugar content is highest, the grower or consumer can store refrigerated ears up to 7-10 days and maintain satisfactory sweetness.

The varieties of supersweet corn that were first developed and released in the 1960s and 1970s had several characteristics that adversely affected yield and quality (Wong et al. 1994). Tough pericarps surrounding the endosperm produced kernels that were tough to chew. Incomplete coverage by the husks resulted in unsightly exposed ear tips. Seed vigor was poor in cool soil at the expense of stand density. Planting had to be delayed until the soil warmed to 60-65F. Most deficiencies have been corrected in new cultivars.

Current outlook

Among all vegetables grown in Connecticut, sweet corn ranks first in acres grown and cash value, According to the New England Agricultural Statistics Service, Connecticut growers harvested 4,500 acres of sweet corn in 1996. This crop was valued at 7.9 million dollars, a 70% increase since 1987. This value represented 47% of the cash value of all vegetables produced in Connecticut and 1.7% of all agricultural products.

Much of the sweet corn produced is sold through roadside markets. An enterprise budget, developed by Bravo-Ureta (1985) estimated a net return of $1038/A for early corn based on a conservative harvest of 1000 dozen ears. This budget did not include expenditures for plastic mulch or row covers.

In this bulletin, I report yield and quality of 6 bicolor cultivars of supersweet corn grown at Windsor and Mt. Carmel in 1995. I also discuss strategies to maximize yield through cultivar selection and use of plastic mulch and row covers to allow earlier planting and harvest when retail prices are highest.

METHODS AND MATERIALS

Soils

The corn were conducted at the Valley Laboratory, Windsor on Merrimac sandy loam, a well drained sandy terrace soil with somewhat limited moisture holding capacity, and at Lockwood Farm, Mt. Carmel (Hamden) on Cheshire fine sandy loam, a well drained loamy upland soil with a moderate moisture holding capacity.

Cultivars

Seeds were obtained from several domestic suppliers. Six cultivars of bicolor supersweet corn containing the sh2 gene were tested. They include the early-maturing Sweet Heart (65 days) and Top Notch (70 days), the main season Skyline (73 days) and Confection (74 days), and late-maturing Eagle (81 days) and Summer Sweet 8102 (81 days). In germination trials, all seeds were coated with fungicide to minimize rotting. In cultivar evaluation trials, all seeds were coated except Eagle and Skyline.

Fertilization

The soils in all trials were fertilized with 10-10-10 at a rate of 110 lb N/A at Windsor and 120 lb N/A at Mt. Carmel. The soils were sidedressed with urea 4 weeks after planting at a rate of 50 lb N/A at Windsor and 30 lb N/A at Mt. Carmel. Soil pH was about 6.5 at both sites and did not require lime.

Culture

Cultivar evaluation: The first crop was seeded in the field at both sites June 19-20; the second crop July 6-8. Each planting consisted of six 12x12-foot randomized blocks in four replications. Each block, surrounded by a 3-foot aisle, contained four rows of a single cultivar spaced 3 feet apart. Seeds were planted 10 inches apart within rows with a density of 60 plants/block. All plots were irrigated following seeding to assist germination. During the growing season, all plots were irrigated four times at Windsor and three times at Mt. Carmel.

Germination test: To test germination of supersweet corn cultivars in cool soils one row of each cultivar was planted May 10, 17, and 24, 1996. The rows were 66 feet long and spaced 3 feet apart. Each row was divided into 20-foot segments forming a 20x21-foot block separated by a 3-foot aisle. Seeds were planted at 10-inch intervals within rows. After planting, one block was covered with 4 mil clear polyethylene film, and another with spun-bonded polyester (Reemay) row cover. The remaining control block was uncovered. All covers were pinned to the soil with 6-inch heavy wire staples. In successive plantings, the treatments were randomly placed. After 10 days, the covers were removed and the emerging seedlings counted.

Soil temperatures were taken periodically at a 1-inch depth at three sites within each block during the 10-day germination trial.

Weed control

Lariat (alachlor + atrazine) (3.75 qt/A) was applied when the emerging corn was in the spike stage (before the leaves began to unfurl).

Insect control

At Windsor, corn earworms and European corn borers were controlled with esfenvalerate (Asana) XL (9.6 oz/A) in the pretassel stage. At Mt. Carmel, carbaryl (Sevin) (1.5 qt/A) was similarly applied.

Harvest

In the cultivar evaluation test, ears were harvested when they reached full maturity. Ten ears, picked randomly within the center two rows, were used to determine average ear weight, length, and median rows of kernels. These ears were also graded for quality and uniformity. Grading of ears is largely subjective and relies on visual evaluation of the appearance of the ear, i.e. straightness of the ear and rows of kernels and completeness of the rows. Local weather conditions at the time of pollination determines its effectiveness. High winds, blowing across the plant rows, may cause incomplete transfer of pollen from tassel to silk (Splittstoesser 1979). Winds and heavy rain may also cause the plants to lodge if insufficient prop roots have formed when the plants are young. Phototropic response may cause the ears to bend upward as they form on lodged plants. Poor pollination may also occur if the plant is under moisture stress (Yamaguchi 1983) . The ears were graded as follows:

Grade 1. Marketable ears with straight rows from base to tip and no kernel skips within the row or disappearance of row along the axis of the ear, i.e. a perfect ear.

Grade 2. Marketable ears with occasional skips of kernels along the row or rows that terminate along the axis. Also incomplete base or tip fill less than 1 inch from base or tip and rows that are skewed along the axis.

Grade 3. Unmarketable ears whose incomplete base or tip fill exceeds 1 inch, the rows were incomplete or highly skewed.

The remaining marketable ears from all plants in the cultivar block were harvested to determine ears/plant.

Rainfall

Rainfall throughout the growing season, June-October, is shown in Figure 1. Each bar represents the departure from the mean monthly rainfall for Hartford and Mt. Carmel reported by the National Weather Service. In 1995, the total rainfall during June-October was 20.7 inches at Windsor and

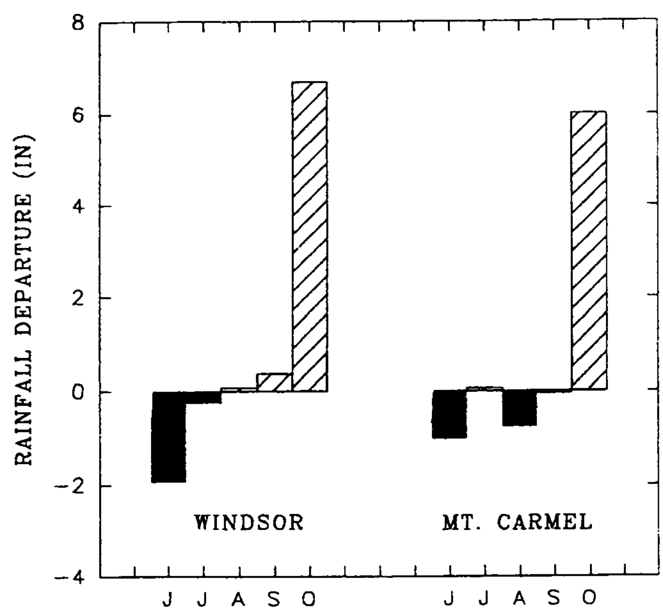

Figure 1. Departure from normal rainfall (0) during the 1995 growing season at Windsor and Mt. Carmel.

20.4 at Mt. Carmel, compared to 30-year averages of 15.7 and 16.2 inches, respectively, at each site. Although total rainfall at Windsor and Mt. Carmel was 5.0 and 4.2 inches above average respectively, water deficits occurred in two of four months from June to September, accounting for a water shortage of 1.8 inches at both sites. In October, heavy rains, exceeding 9.0 inches at both sites, erased the deficit for the growing season. Water deficits from June-September were somewhat alleviated by irrigation which was especially useful following planting to promote germination of seed.

GERMINATION TESTS

One of the deleterious characteristics of supersweet corn is poor germination in cool soil. Although recently released cultivars have improved seed vigor, caution is given by seed companies to plant after soil temperatures have risen above 60-65F to ensure satisfactory germination. Soil temperatures in the vicinity of the planted seed, however, can be increased by covering the soil with clear plastic mulch or row covers. These treatments permit earlier planting and harvest dates and allow the grower to take advantage of higher fresh corn prices early in the season.

In the May 14 planting at Windsor, clear plastic mulch increased germination of Confection, Summer Sweet 8102, and Sweet Heart over 20% compared to the untreated control (Table 1). Reemay row cover increased germination 20% in Confection, and Top Notch compared to the control. Germination of Eagle was reduced by both covers compared to the control.

In the May 13 planting at Mt. Carmel, high germination rates, averaging 89%, were found in the control plot. Plastic mulch reduced the average germination rate of all cultivars 10% and Reemay increased the average germination rate 3% compared to the control. Only Skyline had higher germination under both covers. At both sites, Confection and Summer Sweet 8102 had the highest germination.

During germination of the first planting, the average maximum soil temperature at 1-inch depth at Windsor was 117F under clear plastic mulch, 102F under Reemay, compared to 99F in bare soil. At Mt. Carmel, average maximum soil temperature was 103F under clear plastic, 93F under Reemay, compared to 88F in bare soil. During this germination period, air temperatures exceeded 95F on two consecutive days at both sites, a rarity in early May. It is obvious that soil temperatures at both sites were well above the minimum satisfactory range for germination. The seeds under the clear plastic mulch and Reemay germinated about 3 and 2 days earlier, respectively, compared to bare soil.

In the May 20 planting at Windsor, the average germination of all cultivars was 54% under clear plastic mulch, 85% under Reemay, compared to 78% in the control. Reemay provided slightly higher germination for all cultivars, except Eagle and Sweet Heart.

In the May 21 planting at Mt. Carmel, the average germination of all cultivars under clear plastic mulch was 79%, under Reemay 89%, and 95% in bare soil. Only Top Notch under plastic had a slight increase in germination compared to others.

During germination of this planting at Windsor, the average maximum soil temperature was 108F under clear plastic, 91F under Reemay, and 80F in bare soil. At Mt. Carmel, the average maximum soil temperature was 97F under clear plastic, 95F under Reemay, and 87F in bare soil.

In the May 27-28 planting at Windsor and Mt. Carmel, covers of clear plastic and Reemay reduced germination in all cultivars compared to bare soil. Under clear plastic, soil temperature exceeded 120F on clear days. This high temperature probably killed most of the seed. After the plastic was removed no further germination occurred; this eliminated the possibility that poor germination was due to deficiency in soil moisture.

In short, germination of some cultivars was significantly improved only in the first planting at Windsor. In all other plantings at both sites, soil temperature was not a limiting factor for germination. All cultivars in all plantings at both sites germinated 2 or 3 days earlier under clear plastic or Reemay compared to germination in bare soil. Benefits of soil covers in late-April and early-May plantings remain to be tested.

CULTIVAR EVALUATION

In 1995, yield and quality of the ears were tested. In Crop 2 at Mt. Carmel, average germination of all cultivars was 62%. The stunted plants did not produce marketable ears, hence they were not evaluated.

Ear characteristics

In Crop 1, Eagle, a late-maturing cultivar, had the longest and heaviest ears among at both sites (Table 2). Although the median number of rows was 16, 32% of the ears had 18 rows. The large ears were borne on plants 6-7 feet tall. In Sweet Heart, the length and weight of ears was somewhat greater than others at both sites, but the median number of rows was 12. At Windsor, Top Notch had the shortest and lightest ears among all cultivars, with 12-14 rows of kernels. At Mt. Carmel, the ears of Top Notch were somewhat longer and heavier than at Windsor. Summer Sweet 8102 had the smallest ears with 14-16 rows of kernels.

In Crop 2 at Windsor, Eagle had the longest and heaviest ears with 16-18 rows of kernels among all cultivars. The average weight of Summer Sweet 8102 exceeded 8 ounces and was considerably heavier than those in Crop 1.

Grades

In Crop 1 at Windsor, Grade 1 ears among all cultivars averaged 41%, and Grade 2 averaged 49% (Table 3). Summer Sweet 8102 had the greatest percent perfect ears. At Mt. Carmel, Grade 1 and Grade 2 ears averaged 30% and 57% respectively among all cultivars. Most Grade 2 ears had poor tip fill which left the upper inch of the ear barren. Although such ears were marketable, their appearance was imperfect.

In Crop 2 at Windsor, the average percent of Grade 1 of all cultivars was 28% greater than the average in Crop 1. Confection had the greatest percent Grade 1 followed by Top Notch and Summer Sweet 8102.

Germination and Yield

Germination of all cultivars in both crops at both sites in droughty 1995 was fair to poor. In Crop 1 at Windsor, average germination was 54% compared to 59% at Mt. Carmel (Table 4). At both sites, germination of Confection and Sweet Heart exceeded 70%. In Crop 2, the average germination at Windsor was 56% compared to 62% at Mt. Carmel. Germination of Sweet Heart at Windsor and Top Notch at Mt. Carmel exceeded 70%.

In Crop 1 at Windsor, Eagle and Summer Sweet 8102 produced over two ears/plant (Table 4). The ears of these late-maturing cultivars were borne on 6-7-foot plants. Some marketable ears were borne on large tillers. At Mt. Carmel, marketable ears averaged about one/plant. Confection and Summer Sweet 8102 had the greatest number of plants bearing two ears.

In Crop 2 at Windsor, Summer Sweet 8102 had the greatest number of ears/plant followed by Confection.

Total yield (ears/A) was calculated by multiplying 17,430 plants/A x % germination x ears/plant. In Crop 1 at Windsor, Confection and Summer Sweet 8102 had the greatest yield (Table 4). High yield of Confection resulted from high germination and greater-than-average ears/plant. The high yield of Summer Sweet 8102 was largely due to the high number of ears/plant because germination was less than average. Although Eagle had a high number of ears/plant, yield was low because of poor germination.

In Crop 1 at Mt. Carmel, Confection had the greatest yield of ears. The high yield was due to the high germination rate and greater-than-average number of ears/plant.

In Crop 2 at Windsor, Summer Sweet 8102 had the greatest yield among all cultivars; this was due to high germination and high number of ears/plant. Although Sweet Heart had below-average ears/plant, its high germination rate produced a higher-than-average yield. Conversely, the higher-than-average yield of Confection was mostly due to greater ears/plant because the germination rate was below average. Again, low germination of untreated seed of Eagle resulted in poor yield.

MATURITY

"Days to maturity" printed in the seed catalogues are averages over a broad range of climatic conditions. They inform the grower of the approximate dates to harvest and to evaluate the maturity of individual cultivars relative to other cultivars. This information can be used for crop selection to create a broad harvest span from one planting. The catalogue maturities of cultivars selected for these trials ranged from 65-81 days. The maturities observed in the trials were measured from the planting date to the date of first significant harvest. The maturity of cultivars in Crop 1 at Windsor ranged from 66-80 days; at Mt. Carmel 65-77 days (Table 4). Confection matured 8-9 days earlier and Skyline 3-7 days earlier than catalogue estimates at both sites. Sweet Heart matured 1-5 days later than catalogue estimates at both sites.

In Crop 2 at Windsor, the maturity of all cultivars varied only 1-2 days compared to Crop 1.

MANAGEMENT

Selection of cultivars

In selecting a suitable cultivar, one must consider both yield and quality characteristics that appeal to sight and taste. No cultivars displayed tough kernels when harvested at full maturity. Harvested ears remained sweet for 8-10 days when refrigerated and 5-7 days at room temperature. Harvest could be delayed in the field up to 7 days without loss of quality. This compares to 2-3 days for normal cultivars of sweet corn (su) with lower sugar content.

For yield and quality, Summer Sweet 8102 and Confection were above average in most plantings. Less than 10% of ears in both cultivars were unmarketable. In both crops at Windsor, the ears of Summer Sweet 8102 were mostly Grade 1 with excellent tip fill and husk cover. Despite greater numbers of ears with poor development of kernels at the tip, the ears of Summer Sweet 8102 at Mt. Carmel were large and marketable.

Yield of Confection was also high because of above-average germination and ears/plant. In Crop 1, at both sites, less than 50% of the marketable ears were Grade 1 because of weak tip fill. Husk cover was good.

The ears of Eagle were largest among all cultivars but germination of untreated seed was poor in all plantings. In germination trials in 1996, Eagle's plant population density improved when treated seed was used (Table 1).

The yield of Sweet Heart was above average with above-average germination. The plants bore fewer ears than average. Tip fill and husk cover of the ears were deficient.

The yield of Top Notch and Skyline was below average by virtue of below-average germination and number of ears/plant. Tip fill was weak in Crop 1 at both sites but husk cover was adequate.

Crop covers

Clear plastic mulch and floating row covers are increasingly used to produce earlier crops of sweet corn (Ashley et al. 1992). Both covers increase soil temperature, speed germination, and reduce rotting of seed. Clear plastic, however, must be slit to allow escape of excess heat if temperatures rise above 90F and must be ultimately removed to allow cultivation and sidedressing. Floating row covers increase soil temperature to a lesser degree but do not trap heat in the space between the soil surface and the cover. The row covers can remain on the crop during early growth and protect against early corn borer infestations.

Plastic mulch or row covers create additional expense. To be economically beneficial, the treatment should provide additional yield to offset the cost of the material and the labor to install and remove it. I calculated the current cost of producing an early crop of supersweet corn, without plastic mulch or row cover to be about $625/A. At 1996 prices, costs of 4 mil clear plastic and Reemay row cover are estimated to be $960/A and $1,100/A, respectively, plus $150 labor for installation and removal. At an estimated price of $3.00/dozen for retail at roadside stands for early supersweet corn, the grower would have to produce and sell an additional 370 dozen ears/A or 416 dozen ears/A to offset costs of clear plastic mulch or row cover, respectively. Since the break-even yield for untreated production would be 208 dozen ears/A, the total break-even yield would be 578 dozen ears/A for clear plastic mulch and 624 dozen ears/A for row cover. The break-even yield at a wholesale price of $1.50/dozen would be 417 dozen ears/A for untreated production, 1157 dozen ears/A with clear plastic mulch and 1250 dozen ears/A with row covers.

Based on a seeding rate of 17,430 plants/A times the average ears/plant for each cultivar (Table 4) times the percent germination for each treatment (Table 1), the estimated yield (dozen ears/A) for each treatment was calculated for each planting (Table 5).

In the May 13-14 planting at Windsor, clear plastic mulch increased estimated yield of Confection, Skyline, Summer Sweet 8102, and Sweet Heart while Reemay increased estimated yield of Confection, Summer Sweet 8102, Sweet Heart, and Top Notch compared to the untreated control. At Mt. Carmel, clear plastic mulch and Reemay increased estimated yield of Skyline and Top Notch. In the May 20-21 planting at Windsor and Mt. Carmel, clear plastic mulch reduced estimated yields of all cultivars except Top Notch at Mt. Carmel compared to the control. Reemay slightly increased estimated yield of Confection, Skyline, Summer Sweet 8102, and Top Notch at Windsor; Summer Sweet 8102 and Sweet Heart at Mt. Carmel compared to the control. In the May 27-28 planting at Windsor and Mt. Carmel, clear plastic mulch drastically reduced estimated yield of all cultivars. At Windsor, Reemay slightly increased estimated yield of Skyline compared to the control while at Mt. Carmel, estimated yield of Confection and Top Notch increased.

Were the estimated yields profitable? At a retail price of $3.00/dozen ears for early sweet corn and assuming that all harvested ears were sold, the net profit/acre for each cultivar was estimated (Table 6). All treatments at both sites produced profits for all cultivars if sold at retail except clear plastic mulch in the May 27-28 planting. In the May 13-14 planting at Windsor, high estimated yields of Confection and Summer Sweet 8102 grown under clear plastic mulch and Confection and Top Notch grown under Reemay increased profitability compared to the control. In all other plantings at both sites, untreated plots had the greatest profitability for all cultivars. The treatments did not produce high enough yields to offset the cost of material and labor.

Net profits were also calculated for all cultivars at both sites based on a wholesale price of $1.50/dozen ears (Table 7). Profits were gained with most cultivars in all plantings except those enclosed with parentheses. Extensive net losses were observed at both sites in the May 27-28 planting treated with clear plastic mulch. In all cultivars, at all plantings at both sites, the greatest net profit was gained in the untreated control plot. Summer Sweet 8102 had the greatest net profit at Windsor and the May 27-28 planting at Mt. Carmel. In earlier plantings at Mt. Carmel, Confection provided the greatest net profit among all cultivars.

In short, with a few exceptions, clear plastic mulch and Reemay row covers did not produce as great a net return as untreated production at retail or wholesale levels. Net profits would increase, however, if the cover materials could be salvaged and reused a second year.

Planting dates

From studies at Windsor and Mt. Carmel, in central Connecticut, most cultivars of supersweet corn can be planted without cover after May 20 because soil temperatures are high enough to avoid germination limitations. Clear plastic mulch or row covers produced greater germination and profitability in mid-May in some cultivars compared to uncovered controls. I speculate that benefits of either cover may occur in early-May in central Connecticut.

In July 10 plantings, cultivars with early-to-mid maturity (65-75 days) are preferred. Late-maturing cultivars may occasionally risk frost injury as they reach maturity.

In the cooler soils of the Eastern and Western Highlands, suitable temperatures for supersweet corn may not occur until June 1 without clear plastic mulch or row covers. In mid-May, either cover may increase germination and profit for retail sales.

Special requirements

Plantings of supersweet corn have special needs. The shrunken seeds, smaller than other types of sweet corn, require a planting depth that does not exceed three-fourths to one inch. Planted at greater depths, stand density and yield decreases. Planting in moist soil with temperature exceeding 60F increases germination. Some cultivars, recently released, have improved vigor in cool soil and are identified in seed catalogues.

Supersweet corn must be isolated from other corn types to insure development of maximum sugar content and flavor. Since corn is pollinated by wind, isolation can be accomplished by distance or maturity. Most seed companies recommend a distance of 250 feet between plantings of supersweet corn and other corn types, i.e. normal sugary (su), sugar enhanced (se), pop, field, and ornamental. Large plantings are well isolated if separated by 500 feet, especially if downwind at windy sites with no tree breaks. Isolation by maturity can be accomplished by a separation of 10-14 days between plantings of supersweet corn and other corn types.

White supersweet cultivars also require isolation from bicolor and yellow supersweet cultivars to insure that its white recessive gene is fully expressed.

Supersweet varieties usually develop numerous tillers (suckers) at the base of the stem. Occasionally large tillers develop marketable ears, hence, removal may reduce yield (Yamaguchi 1983).

Finally, germination of seed treated with fungicides produced a denser stand of plants than untreated seed.

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Table 1. Germination (%) in three plantings of bicolor supersweet corn after 10 days under clear plastic mulch or Reemay cover at Windsor and Mt. Carmel, 1996.

	May 13-14 Planting			May 20-21 Planting			May 27-28 Planting		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
WINDSOR									
Confection	83	88	62	58	96	88	0	96	100
Eagle	29	67	71	50	58	67	4	54	62
Skyline	67	33	54	42	83	67	33	83	71
Summer Sweet 8102	83	71	62	67	92	79	0	100	100
Sweet Heart	75	79	58	54	83	88	8	71	88
Top Notch	67	96	67	54	96	79	12	83	92
MT. CARMEL									
Confection	79	100	100	79	83	96	8	96	79
Eagle	62	92	100	75	92	100	4	54	71
Skyline	75	83	58	62	83	100	25	50	79
Summer Sweet 8102	88	92	96	79	100	96	25	96	100
Sweet Heart	75	83	96	71	92	88	12	83	88
Top Notch	96	100	83	100	83	92	33	88	75

Table 2. Characteristics of bicolor corn ears grown at Windsor and Mt. Carmel, 1995.

	WINDSOR			MT. CARMEL		
	Ear Weight[x] oz.	Ear Length[x] in.	Median Rows no.	Ear Weight[x] oz.	Ear Length[x] in.	Median Rows no.
Crop 1 (Planted June 19-20)						
Confection	7.1ace	7.6ab	16	7.3a	7.6b	14
Eagle	8.1ac	7.8a	16	8.2a	8.1a	16
Skyline	6.8abe	7.4ab	14	7.0a	7.6b	14
Summer Sweet 8102	6.5bdf	7.5b	16	5.9b	7.4c	16
Sweet Heart	7.8cd	7.6ab	12	7.0a	7.6b	12
Top Notch	6.2ef	6.9c	14	6.9ab	7.5c	14
Crop 2 (Planted July 6-7)						
Confection	7.2ad	7.0a	16	-	-	-
Eagle	8.9b	7.8b	16	-	-	-
Skyline	7.2ad	7.4ac	14	-	-	-
Summer Sweet 8102	8.4c	7.4c	16	-	-	-
Sweet Heart	7.7a	7.2cd	16	-	-	-
Top Notch	7.0d	7.2ad	12	-	-	-

[x] Mean separation within columns by Tukey's multiple comparison test at P=0.05. Values in columns followed by the same letter within each crop did not differ significantly.

Table 3. Distribution by grade (%) of bicolor supersweet corn grown at Windsor and Mt. Carmel, 1995.

	WINDSOR			MT. CARMEL		
	Grade 1 %	Grade 2 %	Grade 3 %	Grade 1 %	Grade 2 %	Grade 3 %
Crop 1						
Confection	43	52	5	45	45	10
Eagle	49	31	20	44	50	6
Skyline	30	50	20	18	60	22
Summer Sweet 8102	73	25	2	33	65	2
Sweet Heart	10	78	12	22	68	10
Top Notch	42	58	0	20	52	28
Crop 2						
Confection	90	8	2	-	-	-
Eagle	58	35	7	-	-	-
Skyline	58	37	5	-	-	-
Summer Sweet 8102	70	30	0	-	-	-
Sweet Heart	62	38	0	-	-	-
Top Notch	78	22	0	-	-	-

Table 4. Germination, yield, and days to maturity of bicolor supersweet corn grown at Windsor and Mt. Carmel, 1995.

	WINDSOR				MT. CARMEL			
	Germ %	Ears/ Plant No.	Total Yield Ears/A[xy]	Maturity Days	Germ %	Ears/ Plant No.	Total Yield Ears/A[xy]	Maturity Days
Crop 1 (Harvested Aug 23 - Sep 11)								
Confection	72	1.9	23,845a	66	75	1.3	16,995a	65
Eagle	18	2.2	6,900b	80	32	1.0	5,580b	76
Skyline	57	1.4	13,910c	70	60	1.1	11,505bc	66
Summer Sweet 8102	47	2.4	19,660cd	80	54	1.2	11,295ac	77
Sweet Heart	72	1.4	17,570d	70	70	1.1	13,420ac	66
Top Notch	62	1.7	18,370acd	70	64	1.1	12,270ac	66
Crop 2 (Harvested Sep 12 - Oct 5)								
Confection	53	1.6	14,780ac	67	68	-	-	-
Eagle	38	1.0	6,625b	82	40	-	-	-
Skyline	72	1.0	12,550a	67	64	-	-	-
Summer Sweet 8102	62	1.9	20,530d	82	58	-	-	-
Sweet Heart	76	1.2	15,895cd	67	67	-	-	-
Top Notch	60	1.2	12,550a	67	75	-	-	-

[x] Based on 17,430 plant/A (10 inch x 3 foot spacing) x ears/plant x % germination.

[y] Mean separation within columns by Tukey's HSD multiple comparison test at P=0.05. Values in columns followed by the same letter within each crop did not differ significantly.

Table 5. Estimated yield (doz ears/A) of bicolor supersweet corn planted in mid-to-late May at Windsor and Mt. Carmel—1996.

	May 13-14			May 20-21			May 27-28		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
WINDSOR									
Confection	2170	2301	1621	1516	2510	2301	0	2510	2614
Eagle	674	1557	1650	1162	1348	1557	93	1255	1441
Skyline	1362	671	1098	854	1688	1362	671	1688	1444
Summer Swt 8102	2652	2269	1981	2141	2840	2524	0	3196	3196
Sweet Heart	1416	1492	1095	1020	1567	1661	151	1340	1661
Top Notch	1557	2231	1557	1255	2231	1836	279	1929	2138
MT. CARMEL									
Confection	1492	1888	1888	1492	1567	1812	151	1812	1492
Eagle	900	1336	1452	1089	1336	1452	58	784	1031
Skyline	1198	1326	927	991	1326	1598	400	799	1262
Summer Swt 8102	1534	1604	1673	1377	1743	1673	436	1673	1743
Sweet Heart	1198	1326	1534	1135	1470	1406	192	1326	1406
Top Notch	1534	1598	1326	1598	1326	1470	527	1406	1198

Table 6. Estimated net profit/acre (gross returns less total cost) of bicolor supersweet corn in mid-to-late May plantings at a retail price of $3.00/dozen ears. Losses are in parentheses.

	May 13-14 Planting			May 20-21 Planting			May 27-28 Planting		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
WINDSOR									
Confection	4873	5125	4336	2911	5753	6376	(1637)	5753	7315
Eagle	385*	2894	4423	1849	2267	4144	(1358)	1988	3796
Skyline	2449	236	2767	925	3287	3559	376	3287	3805
Summer Sweet 8102	6319	5030	5416	4786	6743	7045	(1637)	7811	9061
Sweet Heart	2611	2699	2758	1423	2924	4465	(1182)	2243	4456
Top Notch	3034	4916	3034	2128	4916	4981	(800)	4010	5887
MT. CARMEL									
Confection	2839	3887	5137	2892	2924	4909	(1181)	3659	3949
Eagle	1063	2231	2579	1630	2231	3829	(1463)	575	2566
Skyline	1957	2201	2254	1336	2201	4267	(437)	620	3259
Summer Sweet 8102	2965	3035	4492	2494	3452	4492	(329)	3242	4702
Sweet Heart	1957	2201	4075	1768	2633	3691	(1061)	2201	3691
Top Notch	2965	3017	3451	3157	2201	3883	(96)	2441	3067

Table 7. Estimated net profit/acre (gross returns less total cost) of bicolor supersweet corn in mid-to-late May plantings at a wholesale price of $1.50/dozen ears. Net losses are in parentheses.

	May 13-14 Planting			May 20-21 Planting			May 27-28 Planting		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
WINDSOR									
Confection	1618	1674	1904	637	1988	2924	(1637)	1988	3394
Eagle	(626)	558	1948	106	245	1808	(1498)	106	1634
Skyline	406	(770)	1120	(356)	755	1516	(630)	755	1639
Summer Sweet 8102	2341	1626	2444	1574	2483	3259	(1637)	3017	4267
Sweet Heart	487	461	1116	(107)	574	1964	(1410)	233	1964
Top Notch	698	1570	1808	246	1570	2227	(410)	1116	2680
MT. CARMEL									
Confection	601	1055	2305	601	574	2191	(1410)	941	1711
Eagle	(287)	227	1651	4	227	1651	(1550)	(601)	1020
Skyline	160	212	846	(150)	212	1870	(1037)	(578)	1366
Summer Sweet 8102	664	629	1982	428	838	1982	(983)	732	2088
Sweet Heart	160	212	1774	66	428	1582	(1349)	212	1582
Top Notch	664	620	1462	760	212	1678	(846)	332	1270

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