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Yellow and Bicolor Supersweet Corn Trials 1996-1997

BY DAVID E. HILL

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SUMMARY

In 1997, five yellow and six bicolor cultivars of supersweet corn (sh2) were tested for cool soil germination in three plantings in late April to early May using clear plastic mulch and floating row covers (Reemay) to warm the soil. The tests were conducted at Windsor, on a sandy terrace soil, and at Mt. Carmel on a loamy upland soil. In 1996 cultivar evaluation trials, six cultivars of yellow supersweet corn (sh2) were grown in early June (Crop 1) and early July (Crop 2) at both sites.

In cool soil germination tests in late April to early May, clear plastic mulch and Reemay floating row covers warmed the soil on sunny days 28F and 13F higher than uncovered soil, respectively. In the warmed soil at both sites, days to germination of 11 cultivars was 4-10 days shorter under clear plastic mulch and 2-6 days shorter under Reemay compared to uncovered soil. Germination of each cultivar in three plantings under clear plastic mulch or Reemay ranged between 61-69% compared to 47-73% in uncovered controls. Maturity (days to harvest) of all cultivars at both sites in covered and uncovered plots ranged between 90-98 days in the April 22-23 plantings, 86-89 days in the April 30-May 2 plantings, and 81-85 days in the May 8-12 plantings. Although planted a week apart, most early-maturing cultivars in the first and second crop were harvested on the same day in mid-July. A single planting of early-maturing Confection and late-maturing Summer Sweet 8102 provided a harvest span of 12 days.

In the cultivar evaluation trials at Windsor, the average yield of six yellow cultivars in Crop 1 was 15,485 ears/A compared to 20,885 ears/A at Mt. Carmel, a 35% difference. Lower average yield at Windsor was due to lower germination rates than at Mt. Carmel (56% vs. 79%). In Crop 2 at Windsor, average yield of six cultivars was 12,075 ears/A compared to 6,580 ears/A at Mt. Carmel. Lower average yield at Mt. Carmel, a reversal from Crop 1, was due to lower average germination rates compared to Windsor (77% vs 55%). Poor yields at Mt. Carmel were also due to stunting and failure of many ears to reach marketable size as heavy rains in August leached nutrients from the soil. Among the cultivars tested, Summer Sweet 7620 had the greatest yield at both sites (20,290 ears/A). Yield of Northern Extra Sweet was above average in all plantings, and its ears were longest (8.2 inches) and heaviest (8.5 ounces) among all cultivars. Supersweet Jubilee also had above-average yield of large ears, but they were difficult to wrest from the plant.

Management strategies are discussed to maximize yield through cultivar selection and the use of clear plastic mulch or Reemay row cover. Throughout the testing period, yield increases were observed in 55% of cultivars under clear plastic mulch and 47% under Reemay row cover, compared to yields in uncovered controls. Many increases, however, were not large enough to compensate for the cost of material and labor, even at an estimated retail price of \$3.00/dozen ears. At an estimated wholesale price of \$1.50 dozen ears, net profits for each cultivar throughout the test period were few. Among all cultivars used in the cool soil germination tests, bicolor Confection and Summer Sweet 8102 and yellow Northern Extra Sweet responded well to temperature modification with clear plastic mulch. Their profitability was enhanced by good germination. Opportunities for profit with the use of Reemay row cover at both sites were few because of the high cost of the material; however, reuse of the row covers a second or third year would substantially reduce cost.

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In the United States, sweet corn is a vegetable staple throughout the year. It is eaten on the cob in summer and early fall. In winter and spring, frozen and canned corn is often supplemented by fresh corn grown in frost-free areas of Florida.

Corn cobs found among the relics of archeological digs in caves discovered in southern Mexico attest to its earliest use 5400-7200 years ago (Yamaguchi 1983). The earliest corn, referred to as Indian corn or maize, was starchy and the dried kernels were ground and used for food. Sweet corn, a mutation of field corn, was grown by Indians and adopted by pioneers late in the 18th Century (Splittstoesser 1979). Constant improvement of varieties by geneticists have created more than 2000 hybrids.

There are three genetic categories of sweet corn. The normal sugary varieties (su) have less than 10% total sugar content (fructose + glucose + sucrose) in the endosperm, 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 ears to retain sweetness at least 10 days under refrigeration. In the normal sugary types, the sugar is mostly converted to starch within 2-3 days.

Southern corn growers can now ship their supersweet corn to distant markets without loss of sweetness or flavor. For northern growers, retention of sweetness allows a more relaxed harvest schedule, and consumers no longer have to depend on a "same-day, plant-to-pot" tactic to insure maximum sweetness and taste. In supersweet corn, the highest sugar content occurs about 24 days after the silk has formed in about half the plants (Creech 1965). If harvested at the highest sugar content, the grower or consumer can store refrigerated ears up to 7-10 days and maintain sweetness.

The earliest supersweet corn varieties, 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 difficult 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 compared to normal sweet corn that germinates at 50F. Tough pericarps and poor tip coverage by the husks have largely been eliminated by geneticists. Cool soil tolerance has been improved in recently released 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 1997. The 1996 crop on the same acreage was valued at 7.9 million dollars (Anon. 1997) or 42% of the cash value of all vegetables produced in the state.

Much of the sweet corn produced is sold through roadside stands and farmer's markets operating in urban and suburban centers. Approximately 560 farms offer direct sales through roadside stands where a variety of fruit, vegetables, bedding plants, nursery stock, and Christmas trees are offered in season (Anon. 1989). Currently, there are 54 farmers markets in Connecticut with about 150 farmers participating (Conn. Department of Agriculture, personal communication).

In an effort to produce early harvests of sweet corn, when prices are highest, many farmers cover their fields with clear plastic to heat the soil for early germination. 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/A. This budget did not include expenditures for clear plastic mulch or row covers.

In this Bulletin, I report yield and quality of six cultivars of yellow supersweet corn grown in two successive crops at Windsor and Mt. Carmel in 1996. I also report germination tests in cool soil of five yellow cultivars and six bicolor cultivars in three plantings from April 22 through May 12, 1997 at both sites. Finally, I discuss strategies to maximize yield and profit through cultivar selection and the use of clear plastic mulch and row covers to allow early planting and harvest when prices are highest.

METHODS AND MATERIALS

SOILS. The supersweet corn trials 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, on Cheshire sandy loam, a well drained upland soil with moderate moisture holding capacity.

CULTIVARS. Seeds were obtained from several domestic suppliers. In 1996, six cultivars of yellow supersweet corn were evaluated for yield and quality. They included the early-maturing Northern Supersweet (62 days) and Extra Early Supersweet (67 days), the main season Northern Extra Sweet (71 days) and Upstart (74 days), and late-maturing Summer Sweet 7620 (82 days) and Supersweet Jubilee (82 days). In 1996, six bicolor cultivars were evaluated for yield and quality and tested for cool soil tolerance in May 13-28 plantings (Hill 1997). In 1997, early maturing bicolor cultivars Sweetheart (65 days) and Top Notch (70 days), main season Skyline (73 days) and Confection 74 days, and late-maturing Eagle (81 days) and Summer Sweet 8102 (81 days) were retested for cool soil germination in earlier plantings (April 22-May 12). All yellow cultivars were also tested for cool soil germination in 1997 except Upstart which was no longer available. All seeds were treated with fungicide to minimize rotting.

FERTILIZATION. The soils in all trials were fertilized before planting with 10-10-10 at a rate of 110 lb N/A at Windsor and 120 lb N/A at Mt. Carmel. The soils at Windsor were sidedressed with urea 4 weeks after planting at a rate of 50 lb N/A. The soil at Mt. Carmel was sidedressed with ammonium nitrate at a rate of 30 lb N/A. The soil at Windsor was amended with dolomitic limestone at a rate of 2800 lbs/A to achieve a pH of 6.5. The pH of the soil at Mt. Carmel was 6.5 and did not require lime.

CULTURE. *Cool soil germination tests*: To determine tolerance for germination in cool soil, 11 cultivars (five yellow and six bicolor) were planted in a split block design at both sites in three plantings, April 22-23, April 30-May 2, and May 8-12, 1997. In each planting, the rows, 66 feet long, were spaced 3 feet apart. Each row was divided into 20-foot segments forming three 20 x 33-foot blocks each separated by a 3-foot aisle. Seeds of each cultivar 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 row cover (Reemay). The remaining control block remained uncovered. All covers were pinned to the soil with 6-inch wide heavy duty staples whose prongs penetrated the soil 5 inches. In successive plantings, the treatments were randomly placed. After 7 and 14 days, the covers were temporarily peeled back and the emerging seedlings counted. After 21 days, all covers were removed for final counts of germinating seed. Maximum soil temperatures were recorded daily at a 1-inch depth at three sites within each block from April 20 through May 26.

Cultivar evaluation: Six yellow supersweet cultivars were evaluated for yield and quality at both sites. Crop 1 was seeded June 13-14 and Crop 2 July 10-11. Each planting consisted of six 12 x 12-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 producing a potential plant density of 60 plants/block. During the summer, all plots were irrigated once at Windsor and twice at Mt. Carmel.

WEED CONTROL. Lariat (flowable alachlor + atrazine at 3.75 qt/A) was applied when the emerging seedlings were in the spike stage just before the leaves began to unfurl.

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

HARVEST AND GRADING. In cultivar evaluation tests, ears were harvested when they reached full maturity (milk stage). Ten ears, picked randomly within the center two rows of each block, 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 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. Poor tip fill, base fill, and incomplete rows result from incomplete pollination, which may be caused by local weather conditions when pollination occurs. High winds, blowing across the rows, may cause incomplete transfer of pollen from tassel to silk (Splittstoesser 1979). Poor pollination may also occur if the plants are under moisture stress (Yamaguchi 1983)

All ears were graded as follows:

- Grade 1. Marketable ears, greater than 6 inches, with straight rows from tip to base and no kernel skips within rows or disappearance of rows along the axis of the ear.
- Grade 2. Marketable ears, greater than 6 inches, with occasional skips of kernels along the row or rows that terminate along the axis. Also included are ears with incomplete tip or base fill less than 1 inch from the tip or base or rows that are complete but slightly skewed along the axis.
- Grade 3. Unmarketable ears whose incomplete tip or base fill exceeds 1 inch or with rows that are incomplete or highly skewed along the axis. Ears less than 6 inches long were also included in this grade.

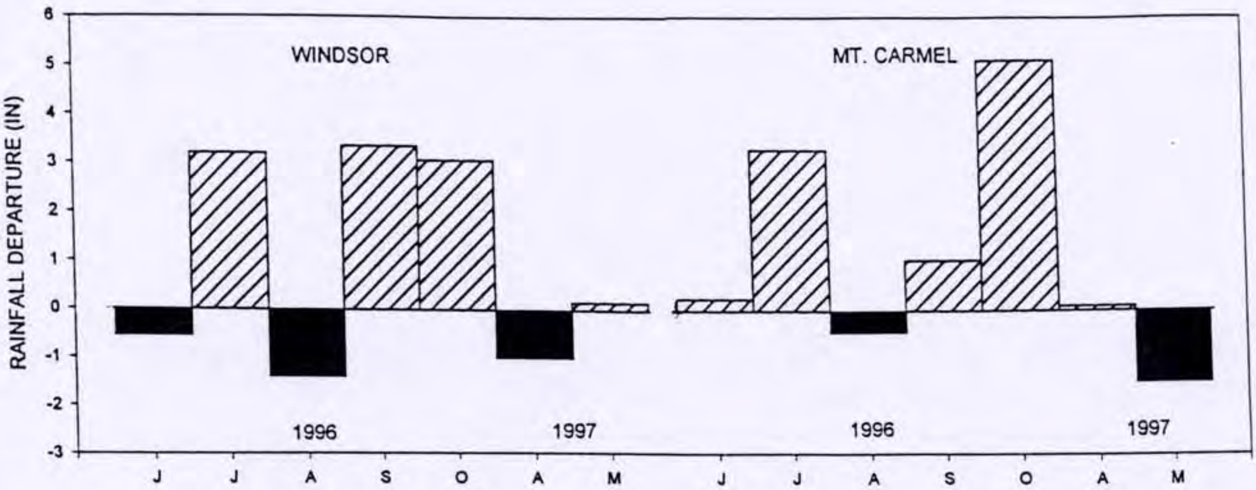

Figure 1. Departure from normal rainfall (0) during the 1996 (June-October) and early 1997 (April-May) growing seasons at Windsor and Mt. Carmel.

RAINFALL. Rainfall throughout the growing season, June-October, 1996, and germination period April-May, 1997 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 1996, the total rainfall during June-October was 23.4 inches at Windsor and 25.5 inches at Mt. Carmel, compared to 30-year averages of 15.7 and 16.2 inches, respectively, at both sites. In April-May, 1997, during cool soil germination tests, rainfall was 6.4 inches at both sites compared to 30-year averages of 7.2 inches at Windsor and 7.8 inches at Mt. Carmel. Although total rainfall during the 1996 growing season at Windsor and Mt. Carmel was 7.7 and 9.3 inches above average, respectively, water deficits at Windsor occurred in June (-0.6 inches) and August (-1.4 inches). At Mt. Carmel, only August had a deficit (-0.4 inches). In September-October, 1996, heavy rains at both sites erased early season deficits. During April-May 1997, water deficits occurred at Windsor (-0.8 inches) and Mt. Carmel (-1.4 inches).

COOL SOIL GERMINATION TESTS

One characteristic of supersweet corn that concerns growers is its tendency to germinate poorly in cool soil. Although many newly released cultivars offer improved vigor, seedsmen still suggest that planting should be delayed until soil temperatures rise above 60-65F to insure satisfactory germination. If these recommendations are followed, planting of supersweet corn in Connecticut should be delayed until mid-May in most upland areas of the state or at best early-May in the Connecticut River Valley and coastal areas that fringe Long Island Sound. Soil temperatures in the vicinity of the planted seed (0.75-1.0 inches) can be increased by covering the soil with clear plastic mulch or floating row covers, allowing plantings in April. Soil temperatures measured during the cool soil germination tests in three successive plantings, April 22-23, April 30-May 2, and May 8-12, demonstrated the magnitude of the increase at both sites. At Mt. Carmel, average maximum soil temperature (April 22-May 26) in plots covered with clear plastic mulch increased 28F on sunny days and 13F on cloudy days compared to uncovered controls (Table 1). In plots covered with floating row covers, average maximum soil temperature increased 13F on sunny days and 9F on cloudy days compared to the uncovered controls. In the sandy soil at Windsor, increases in the average maximum soil temperature in covered plots during measurements in April were even more dramatic. Although the average maximum ambient air temperature at both sites was virtually the same (65F), average maximum soil temperature at Windsor in plots covered with clear plastic mulch was 6F higher, floating row cover 13F higher, and uncovered controls 11F higher than comparable plots at Mt. Carmel. Although average maximum soil temperature was higher in all treatments at Windsor, the difference between covered plots and uncovered plots was similar to Mt. Carmel. This merely illustrates the well-known fact that

Table 1. Average maximum temperature (degrees F) at a 1-inch depth beneath clear plastic mulch, Reemay row covers, and bare soil on clear and cloudy days, April 22-May 26, 1997.

	Clear Days	Cloudy Days
Clear plastic mulch	102	71
Row covers	81	62
Uncovered control	74	57
Ambient air	65	56

sandy soils warm faster in spring than loamy soils. In May, however, the average maximum soil temperature in covered and uncovered plots seldom varied more than 2F between sites. Clear plastic mulch and floating row covers not only increased soil temperature, more importantly, they protected the newly emerging seedlings from spring frosts. What effect did elevated soil temperature have on days to germination, germination percent, and days to maturity?

DAYS TO GERMINATION. In three plantings, the average days to germination of five yellow and six bicolor cultivars in plots covered with clear plastic mulch was shortened 5-9 days at Windsor and 4-10 days at Mt. Carmel compared to uncovered controls, an average of 7 days at both sites (Table 2). In plots covered with floating row covers, average germination of the 11 cultivars in three plantings was shortened 2-6 days at Windsor and 2-4 days at Mt. Carmel compared to uncovered controls, an average of 3.5 days at both sites. In all plantings at both sites, days to germination of individual cultivars within each planting spanned about 4 days. Early maturing cultivars were consistently the first to appear; late maturing cultivars last to appear.

GERMINATION PERCENT. Clear plastic mulch and floating row covers increased average percent germination in five of six plantings at both sites. The only exception was the April 23 planting at Windsor, where both covers failed to increase percent germination (Table 2). Excluding the first planting at Windsor, clear plastic mulch increased average germination of 11 cultivars 16-20% at Windsor and 5-19% at Mt. Carmel compared to uncovered controls. Floating row covers increased average germination 13-14% at Windsor and 13-17% at Mt. Carmel compared to uncovered controls.

Average germination in three plantings at Windsor, covered with clear plastic mulch or floating row cover, ranged from 61-69% compared to a range of 47-73% in uncovered controls. The low germination percentages at Windsor were probably due to a soil moisture deficit (-0.8 inches) in the sandy soil at the time of planting (Figure 1). Moisture content of the soil at planting is critical for the shallowly planted seed. Average germination at Mt. Carmel in covered and uncovered plots declined from the April 22 planting to the May 12 planting. Once again, low germination in the May 12 planting was probably due to a soil moisture deficit (-1.4 inches) at Mt. Carmel (Figure 1).

Average germination rates relate a general picture of germination in each of the three plantings at both sites. Let us now look at the germination success or failure of the individual cultivars that were tested in each planting. In Tables 3 and 4, two benchmarks were chosen to evaluate success or failure. The 75% germination benchmark (+) was chosen because it represented the germination standard for sweet corn published in the Federal Register (Anon. 1994). Seed lots of sweet corn whose germination rate is below 75% cannot enter interstate commerce. The second benchmark, the 90% germination rate (++), was chosen because the increased production/acre may make use of clear plastic mulch or floating row covers economically feasible. The economics of production using covers on early plantings will be fully explained later in the Management Section.

At Windsor, despite low average germination rates of 60-69% in all covered plots (Table 2), several cultivars ex-

Table 2. Effect of clear plastic mulch or Reemay row covers on average days to germination, germination percent, and days to maturity in three early plantings of yellow and bicolor supersweet corn cultivars at Windsor and Mt. Carmel, 1997.

	WINDSOR			MT. CARMEL		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
Planting date		April 23			April 22	
Days to germination	9	11	15	8	10	12
Germination %	61	61	74	95	89	76
Days to maturity	90	95	96	92	93	98
Planting date		May 2			April 30	
Days to germination	9	12	18	7	13	17
Germination %	69	66	53	80	74	61
Days to maturity	86	88	88	86	89	94
Planting date		May 8			May 12	
Days to germination	10	13	15	5	10	13
Germination %	67	61	47	56	68	51
Days to maturity	-	82	85	-	81	85

Table 3. Yellow and bicolor cultivars of supersweet corn exceeding 75% (+) and 90% (++) germination in April 23 (1), May 2 (2), and May 8 (3) plantings in plots covered with clear plastic mulch, Reemay row covers or uncovered controls at Windsor, 1997.

	Clear Plastic Mulch			Reemay Row Covers			Uncovered Control		
YELLOW CULTIVARS	1	2	3	1	2	3	1	2	3
Extra Early Supswt.	+	+	-	+	-	-	-	-	-
Northern Supswt.	-	++	+	-	+	-	++	-	-
Northern Extra Swt.	-	-	+	-	-	+	+	-	-
Summersweet 7620	-	-	-	-	-	-	-	-	-
Supswt. Jubilee	-	-	-	-	-	-	-	-	-
BICOLOR CULTIVARS	1	2	3	1	2	3	1	2	3
Confection	+	-	+	+	+	++	+	-	-
Eagle	-	-	-	-	-	-	-	-	-
Skyline	++	-	+	++	+	-	+	-	-
Summersweet 8102	-	+	-	-	+	-	++	-	-
Sweetheart	++	+	+	++	+	+	+	-	-
Topnotch	+	+	-	+	-	-	++	+	-

Table 4. Yellow and bicolor cultivars of supersweet corn exceeding 75% (+) and 90% (++) germination in April 22 (1), April 30 (2), May 12 (3) plantings in plots covered with clear plastic mulch, Reemay row covers or uncovered controls at Mt. Carmel, 1997.

	Clear Plastic Mulch			Reemay Row Covers			Uncovered Control		
YELLOW CULTIVARS	1	2	3	1	2	3	1	2	3
Extra Early Supswt.	++	++	+	++	+	-	++	+	-
Northern Supswt.	++	+	+	++	+	+	++	-	-
Northern Extra Swt.	++	+	+	++	+	+	++	-	-
Summersweet 7620	+	-	+	-	-	-	-	-	-
Supswt. Jubilee	+	-	+	+	-	-	-	-	-
BICOLOR CULTIVARS	1	2	3	1	2	3	1	2	3
Confection	++	+	+	++	++	+	++	-	-
Eagle	+	+	+	+	-	-	-	-	-
Skyline	+	+	+	+	+	+	+	-	-
Summersweet 8102	+	++	+	++	+	-	+	-	-
Sweetheart	++	++	+	++	++	+	++	+	-
Topnotch	++	++	+	++	++	+	++	-	+

ceeded the benchmarks that were established. Among the yellow cultivars, germination rate of Northern Supersweet exceeded 90% under clear plastic mulch (May 2 planting) and the uncovered control (April 23 planting) (Table 3). Germination of Northern Supersweet also exceeded 75% in two other covered plots. Germination of Extra Early Supersweet exceeded 75% in two of three plantings covered with clear plastic mulch and one of three plantings covered with floating row covers. Cool soil germination of the late maturing cultivars Summer Sweet 7620 and Supersweet Jubilee was very poor under both covers.

At Windsor, among the bicolor cultivars, Sweetheart had the greatest vigor. Germination exceeded 90% under both covers in the April 23 planting and above 75% in all covered treatments in the May 2 and May 8 plantings. Germination of Skyline also exceeded 90% under both covers in the April 23 planting. Confection's vigor was also above average with germination exceeding 75% in all but one covered plot in three plantings. Germination of Eagle, a late maturing cultivar, was below average in all covered and uncovered plots.

At Mt. Carmel, germination of yellow and bicolor cultivars was more vigorous than at Windsor. Among yellow cultivars, germination of Extra Early Supersweet exceeded 90% in all covered and uncovered plots in the April 22 planting (Table 4). It also exceeded 75% in all plots in the April 30 planting. Germination of Northern Supersweet and Northern Extra Sweet exceeded 90% or 75% in all covered plots in all plantings. Germination of Summer Sweet 7620 and Supersweet Jubilee was below average in all plantings, similar to Windsor.

Among bicolor cultivars, germination of Sweetheart and Top Notch exceeded 90% in all covered plots in the April 22 and April 30 plantings and above 75% in the May 12 planting. Germination of Confection exceeded 90% in all covered plots in the April 22 planting and 75% in all other plantings. Germination of Skyline exceeded 75% in all covered plots in all plantings. In uncovered controls, germination of Sweetheart, Top Notch, and Confection exceeded 90% in the April 22 planting. Summer Sweet 8102 and Eagle exceeded 75% in all plantings under clear plastic mulch. Eagle germinated poorly under floating row covers and uncovered controls.

DAYS TO MATURITY. Days to maturity is important to estimate the date of the first harvest. The maturity information supplied by seedsmen are general estimates from data gathered from a broad geographical area. The best use of this information is to determine the relative maturity among several cultivars offered in the catalogues. Maturity, however, depends on seasonal differences in temperature, moisture supply, and daylength. What effect did clear plastic mulch and floating row covers have on the average maturity of all cultivars in the three plantings at both sites? First, average days to maturity decreased in each successive planting in all plots at both sites. In the April 22-23 plantings (harvested July 17 to August 1), maturity ranged from 90-98 days in covered and uncovered plots at both sites (Table 2). In the April 30-May 2 plantings (harvested July 22 to August 1), average maturity decreased to 86-89 days in all plots at both sites (except in uncovered plots at Mt. Carmel). In the May 8-12 plantings (harvested July 22 to August 8), average maturity again decreased to 81-85 days in all surviving plots.

At both sites, early maturity in covered plots was largely due to earlier germination. In plots covered with clear plastic mulch, average days to maturity decreased 2-6 days in two crops at Windsor and 3-5 days in two crops at Mt. Carmel compared to uncovered controls. In plots with floating row covers, average days to maturity decreased 3-5 days in three crops at Windsor and 4-5 days in three crops at Mt. Carmel compared to uncovered controls.

The span of maturity of individual cultivars within each planting at both sites (i.e. the difference in days to maturity of early maturing cultivars vs. days to maturity of late maturing cultivars) varied 15-17 days for all treatments in the three crops at both sites. This span is slightly less than the span of maturity (16-20 days) listed for the cultivars in seed catalogues. The span of maturity estimates the number of harvest days that can be expected from a single planting with several cultivars having early and late maturities.

CULTIVAR EVALUATION

In 1996, yield and quality of the ears from cultivars of yellow supersweet corn were evaluated for two plantings at Windsor and Mt. Carmel.

EAR CHARACTERISTICS. In Crop 1 (June planting) at Windsor, Northern Extra Sweet, Supersweet Jubilee, and Northern Supersweet had the longest and heaviest ears with average length exceeding 8 inches and average weight exceeding 8 ounces (Table 5). The long slender ears had 12-14 rows of kernels. At Mt. Carmel, the average length of ears of Northern Extra Sweet and Northern Supersweet exceeded 8 inches and the average weight exceeded 9 ounces. The ears of Supersweet Jubilee were borne high on the plant but were very difficult to wrest from the stalk because the shank that attaches the ear to the stalk was very fibrous. At both sites the ears of Summer Sweet 7620 and Upstart were shorter and lighter than the ears of other cultivars, but the median rows were among the highest (16-18).

In Crop 2 (July planting), the average length and weight of most cultivars at both sites decreased compared to Crop 1. Average ear length of Northern Supersweet and Northern Extra Sweet exceeded 8 inches at both sites. The average ear weight was slightly greater at Mt. Carmel than at Windsor

Table 5. Characteristics of yellow supersweet corn ears grown at Windsor and Mt. Carmel, 1996.

	WINDSOR			MT. CARMEL		
	Avg Ear Weight[x] Oz.	Avg Ear Length[x] In.	Median Rows No.	Avg Ear Weight[x] Oz.	Avg Ear Length[x] In.	Median Rows No.
CROP 1 (Planted June 13-14)						
Extra Early S.S.	7.8ce	8.2ae	14	8.8abd	8.2b	14
Northern S.S.	8.2abc	8.4be	12	9.2bd	8.1ab	12
Northern Extra Swt.	8.9b	8.4b	12	9.3b	8.1b	12
Summer Sweet 7620	7.4ce	7.6c	16	6.4c	7.0cd	16
S.S. Jubilee	8.5ab	8.1a	16	7.8a	7.7a	16
Upstart	7.6de	6.7d	18	7.9ad	6.8d	16
CROP 2 (Planted July 10-11)						
Extra Early S.S.	7.3c	7.6e	14	7.6bd	7.2e	12
Northern S.S.	6.7ac	8.1b	12	7.9ab	8.0ab	12
Northern Extra Swt.	7.3ac	8.3abe	12	8.4b	8.0b	12
Summer Sweet 7620	6.0b	7.0c	16	5.8c	6.8c	16
S.S. Jubilee	7.8a	7.9a	16	6.6ac	7.8a	16
Upstart	5.7b	6.1d	16	6.7cd	6.2d	16

[x]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 6. Distribution by grade of yellow supersweet corn grown at Windsor and Mt. Carmel, 1996.

	WINDSOR			MT. CARMEL		
	Grade 1 %	Grade 2 %	Grade 3 %	Grade 1 %	Grade 2 %	Grade 3 %
CROP 1						
Extra Early Supersweet	82	15	3	82	18	0
Northern Supersweet	88	8	4	88	12	0
Northern Extra Sweet	92	8	0	80	18	2
Summersweet 7620	85	15	0	80	12	8
Supersweet Jubilee	95	5	0	85	8	7
Upstart	88	12	0	80	20	0
CROP 2						
Extra Early Supersweet	95	3	2	40	45	15
Northern Supersweet	90	8	2	70	28	2
Northern Extrasweet	82	15	3	70	15	15
Summer Sweet 7620	65	35	0	50	41	9
Supersweet Jubilee	88	12	0	53	44	3
Upstart	88	12	0	92	8	0

for both of these cultivars. The ears of Summer Sweet 7620 and Upstart again were smaller than the ears of other cultivars at both sites but the median number of rows was among the highest.

GRADES. In Crop 1 at Windsor, Grade 1 ears averaged 88% and Grade 2 10% among all six cultivars (Table 6). Northern Extra Sweet and Jubilee had the greatest percent perfect ears. At Mt. Carmel, Grade 1 averaged 82% and Grade 2 ears 14% among all cultivars. Only 2-4% of ears at both sites were considered unmarketable.

In Crop 2 at Windsor, grade 1 ears averaged 85% and Grade 2 averaged 14%. Grade 1 ears of Extra Early Supersweet and Northern Supersweet exceeded 90%. In Summer Sweet 7620, 35% of ears had slightly imperfect tip fill but the ears were marketable. At Mt. Carmel, Grade 1 ears averaged 62% and Grade 2 averaged 30% among all cultivars. A notable exception was Upstart with 92% Grade 1 ears. In all other cultivars, 15-45% of the ears had imperfect tip or base fill or were less than 6 inches long.

GERMINATION AND YIELD. Germination of all yellow cultivars in both crops at both sites was good to poor. In Crop 1, average germination of all cultivars was 56% at Windsor compared to 79% at Mt. Carmel (Table 7). Poor germination at Windsor was probably due to low moisture content of the soil during seeding in June (Figure 1). At Mt. Carmel, soil moisture was not a limiting factor. Germination of Northern Extra Sweet, Extra Early Supersweet, Northern Supersweet, and Supersweet Jubilee exceeded 80%. At Windsor, only Northern Extra Sweet exceeded 70%.

In Crop 2, average germination at Windsor was 77% compared to 55% at Mt. Carmel. At Windsor, germination of all cultivars, except Upstart, exceeded 80%. Germination of Northern Extra Sweet alone exceeded 75% at Mt. Carmel.

Production of marketable ears/plant was highly variable for both crops at both sites (Table 7). In Crop 1 at Windsor, Summer Sweet 7620, Supersweet Jubilee, and Upstart produced two or more ears/plant. The ears of Summer Sweet 7620 and Supersweet Jubilee, late maturing cultivars, were borne on 6-7-foot plants. Some marketable ears of Upstart were borne on large tillers. It is significant to note that the germination of the cultivars that produced two or more ears/plant was somewhat poor, and the lack of competition within the stand produced larger plants and ears. In Crop 1 at Mt. Carmel, ears/plant averaged 1.5 among all cultivars. Ninety percent of Upstart plants produced two ears, but only 10% of Extra Early Supersweet produced two ears.

Ears/plant in Crop 2 decreased at both sites. At Windsor, only Summer Sweet 7620 averaged more than one ear/plant.

Table 7. Germination, yield, and days to maturity of yellow supersweet corn grown at Windsor and Mt. Carmel, 1996.

	WINDSOR				MT. CARMEL			
	Germ. %	Mktable Ears/ Plant No.	Total Yield Ears/A^{xy}	Maturity Days	Germ. %	Mktable Ears/ Plant No.	Total Yield Ears/A^{xy}	Maturity Days
CROP 1 (Harvested Aug 21-Sep 4)								
Extra Early S.S.	58	1.2	12,130a	68	85	1.1	16,295c	70
Northern S.S.	63	1.0	10,980a	68	87	1.4	21,230abc	70
Northern Extra Swt.	69	1.3	15,635ab	68	88	1.4	21,475b	70
Summer Sweet 7620	58	2.0	20,220b	80	73	1.6	20,360abc	82
S.S. Jubilee	48	2.0	16,735ab	80	80	1.8	25,100a	80
Upstart	38	2.6	17,220ab	75	63	1.9	20,865abc	73
CROP 2 (Harvested Aug 16-Oct 9)								
Extra Early S.S.	84	0.7	10,250c	72	64	0.6	6,695ab	74
Northern S.S.	85	0.9	13,335ac	68	55	0.7	6,710ab	72
Northern Extra Swt.	91	0.9	14,275a	68	78	0.7	9,515a	72
Summer Sweet 7620	83	1.1	15,915ac	87	57	0.5	4,970b	90
S.S. Jubilee	85	0.9	13,335a	91	48	0.8	6,695ab	90
Upstart	34	0.9	5,335b	76	28	1.0	4,880b	74

^{x}Based on 17,430 plants/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.

Low marketable ears/plant at Mt. Carmel may have been due to nutrient leaching during August when over 8 inches of rain fell. Many ears were not 6 inches long.

Total ears/A was calculated by multiplying 17,430 plants/A (spacing 10 x 36 inches) X % germination X average ears/plant. In Crop 1, average yield of all cultivars at Windsor was 15,485 ears/A compared to 20,885 ears/A at Mt. Carmel, a 35% difference. Lower average yield at Windsor was due to lower germination rates. At Windsor, Summer Sweet 7620 had the greatest yield by virtue of above average ears/plant. Although Supersweet Jubilee and Upstart had two or more ears/plant, low germination prevented high yield/A. At Mt. Carmel, Supersweet Jubilee had the greatest yield/A by virtue of high germination and ears/plant. Total yield/A of all cultivars, except Extra Early Supersweet, exceeded 20,000 ears/A.

In Crop 2, the average yield/A of all cultivars was 12,075 at Windsor compared to 6,580 at Mt. Carmel, an 84% difference. Low yield/A of all cultivars was due to low germination and production of ears/plant. Although most plants produced at least two ears, many failed to reach marketable size.

MATURITY

Maturity of late-April to early-May plantings were discussed earlier with respect to crop covers in the cool soil germination tests. We will now examine maturity of cultivars planted later in June and July. The maturities observed in the trials were measured from the planting date to the date of the first significant harvest. The maturities of cultivars in Crop 1 at Windsor ranged from 68-80 days; at Mt. Carmel 70-82 days (Table 7). Most cultivars were within 3 days of the catalogue maturities (67-82 days). Northern Supersweet, however, matured 6-8 days later than the catalogue maturity at both sites.

Maturities in Crop 2 ranged from 72-91 days at Windsor and 72-90 days at Mt. Carmel. Compared to Crop 1, maturity of early and main season cultivars in Crop 2 increased 0-4 days and 7-11 days for late maturing cultivars in response to decreasing temperature and daylength in September.

MANAGEMENT

CROP COVERS. Clear plastic mulch and floating row covers are used to produce early crops of sweet corn (Ferro et al. 1997). Both covers increase soil temperature, speed germination, and increase percent germination. Clear plastic, however, must be slit to allow escape of excess heat that would kill emerging seedlings. They must ultimately be removed to allow cultivation and sidedressing of fertilizer. Floating row covers increased soil temperature to a lesser degree but did not trap heat in the space between the soil surface and the cover. Floating row covers can remain on the crop during early growth to protect against early corn borer infestations, but they negate cultivation to control weeds if herbicides are not used.

Plastic mulch or floating row covers create additional expense. To be economically beneficial, the covers should provide additional yield to offset the cost of the material and the cost of labor to install and remove it, or it should produce earlier yields when prices of locally grown sweet corn are highest. In 1996, I calculated the cost of producing an early crop of supersweet corn, without clear plastic mulch or floating row cover, to be about $625/A (Hill 1997). At 1998 prices, the cost of 1.1 mil slit clear plastic mulch and Reemay row cover is estimated to be $650/A and $1250/A, respectively, plus $150/A for installation and removal. Thus, total production cost would be $1425/A with slit clear plastic mulch and $2025/A with Reemay row cover. At an estimated price of $3.00/dozen ears retail at roadside stands for supersweet corn, the break-even yield would be 203 dozen ears/A for no cover, 475 dozen ears/A for slit clear plastic mulch and 675 dozen ears/A for Reemay row covers. The break-even yield at a wholesale price of $1.50/dozen ears would be 417 dozen ears/A for uncovered production, 950 dozen ears/A for slit clear plastic mulch, and 1350 dozen ears/A for Reemay row covers.

The yield of each cultivar used in the cool soil germination tests was calculated for each planting at both sites (Table 8). The yield was based on a population of 17,430 plants/A X the average ears/plant X the percent germination for each treatment.

In April 22-23 plantings, clear plastic mulch increased yields of 6 of 11 cultivars at both Windsor and Mt. Carmel compared to yields in the uncovered control. Floating row covers increased yield of 4 of 11 cultivars at Windsor and 1 of 11 cultivars at Mt. Carmel compared to the uncovered control. In the April 30-May 2 plantings, clear plastic mulch increased yields of 4 of 11 cultivars at Windsor and 8 of 11 cultivars at Mt. Carmel compared to yields in the uncovered control. Floating row covers increased yields of 4 of 11 cultivars at Windsor and 6 of 11 cultivars at Mt. Carmel compared to yields in the uncovered control. In the May 6-12 plantings, floating row covers increased yields of 3 of 11 cultivars at Windsor and 11 of 11 cultivars at Mt. Carmel compared to yields in the uncovered control. No comparisons could be made between clear plastic mulch and the uncovered controls at both sites because emerging seedlings were killed by heat that had accumulated beneath the clear plastic mulch.

Although yield increases were observed in 55% of cultivars covered with clear plastic mulch and 47% of cultivars covered with floating row covers in three plantings at both sites, were they large enough to offset the added production costs? To determine profitability, the estimated yield/A of each cultivar was multiplied by an estimated retail price of $3.00/dozen ears to obtain gross returns. The total produc-

Table 8. Estimated yield (doz ears/A) of yellow and bicolor supersweet corn planted late-April to early May at Windsor and Mt. Carmel, 1997. Yields in covered plots higher than yields in uncovered controls are marked with an asterisk.

	April 22-23			April 30-May 2			May 8-12		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
					WINDSOR				
YELLOW									
Extra Early Supswt.	1452*	464	1394	638	751	1513	-	1159	2205
Northern Supswt.	1214*	1162*	1157	641	927	1687	1862*	2092*	1338
Northern Extra Swt.	984*	582	697	641	404	813	-	1512*	1450
Summer Sweet 7620	1569*	1687*	1452	874	1336*	872	-	872*	349
Supswt. Jubilee	1339	1394*	1339	928	1107	1682	-	1394	1512
BICOLOR									
Confection	1917*	1394	1854	1107	1684*	1511	-	1853	2147
Eagle	1511	1225	1745	1220*	1803*	930	-	930*	581
Skyline	1508	989	1685	756*	930*	578	-	464	1513
Summer Sweet 8102	2326*	2036	2205	1569	1917	2036	-	930*	870
Sweetheart	1572	818	1623	1685*	465	1218	-	634	1046
Top Notch	1280	1976*	1508	1744*	869	1280	-	1450	1452
					MT. CARMEL				
YELLOW									
Extra Early Supswt.	1450*	521	895	690	813	982	-	1225*	990
Northern Supswt.	1338	1630	1802	986*	1336*	810	-	1049	810
Northern Extra Swt.	1630*	989	1227	817	1278*	1106	-	1336*	753
Summer Sweet 7620	1708*	810	753	639*	58	520	-	753*	520
Superswt. Jubilee	1329*	866	1105	758*	349*	0	-	700*	116
BICOLOR									
Confection	1924*	1563	1569	1336*	1103*	872	-	1452*	753
Eagle	695	634	869	1046*	288	525	-	812*	408
Skyline	1562	1220	1631	1623*	581	582	-	1740*	521
Summersweet 8102	1336	1220	1391	1563	1104	1570	-	1283*	1220
Sweetheart	1513*	1450*	1227	1687*	1099*	813	-	1280*	583
Top Notch	1506	1339	1510	1854*	1163*	929	-	1452*	751

tion cost/A ($1425 for clear plastic mulch, $2025 for Reemay row cover, and $625 without cover) was then subtracted to determine the net profit/A. It is assumed that all marketable corn is harvested and sold.

In the April 23 planting at Windsor, only the yellow cultivar (Y) Northern Extra Sweet under clear plastic mulch and the bicolor cultivar (BC) Top Notch under floating row cover had greater profit than the uncovered control (Table 9). For all others, total production cost reduced profitability below the profitability in uncovered controls. Among all cultivars, Summer Sweet 8102 (BC) had the greatest profit/A with or without cover. Net profit/A exceeded $4,200 for all but one bicolor cultivar in uncovered controls.

In the May 2 planting at Windsor, Eagle (BC), Sweetheart (BC), and Top Notch (BC), under clear plastic mulch and Eagle (BC) under floating row cover had greater profit/A than uncovered controls. For all other cultivars, greater profit/A was observed without mulch or row covers. Similar to the April 23 planting, Summer Sweet 8102 (BC) had the greatest profit/A among all cultivars without cover.

In the May 8 planting at Windsor, Northern Supersweet (Y) had the greatest profit/A under clear plastic mulch and floating row cover compared to uncovered controls. The greatest profit/A was Extra Early Supersweet (Y) without

Table 9. Estimated net profit/acre (dollars gross returns less total cost) of yellow and bicolor supersweet corn in late-April to mid-May plantings at a retail price of $3.00/dozen ears. Losses are in parentheses. Net profit in covered plots higher than net profit in uncovered controls are marked with an asterisk.

	April 22-23			April 30-May 2			May 8-12		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
					WINDSOR				
YELLOW									
Extra Early Supswt.	2931	(633)	3557	489	228	3914	-	1452	5990
Northern Supswt.	2217	1461	2846	498	755	4436	4161*	4251*	3389
Northern Extra Swt.	1527*	(279)	1466	498	(813)	1814	-	2511	3725
Summer Sweet 7620	3282	3036	3731	1197	1983	1991	-	591*	422
Supersweet Jubilee	2592	2157	3392	1359	1287	4421	-	2157	3911
BICOLOR									
Confection	4326	2157	4937	1896	3027	3908	-	3534	5816
Eagle	3108	1650	4510	2235*	3384*	2165	-	765	1118
Skyline	3099	942	4430	843	765	1109	-	(633)	3914
Summer Sweet 8102	5553	4083	5990	3282	3726	5483	-	765	1985
Sweetheart	3291	429	4244	3630*	(630)	3029	-	(123)	2513
Top Notch	2415	3903*	3899	3807*	582	3215	-	2325	3731
					MT. CARMEL				
YELLOW									
Extra Early Supswt.	2925*	(462)	2060	645	414	2321	-	1650	2345
Northern Supswt.	2589	2965	4781	1533	1983	1805	-	1122	1805
Northern Extra Swt.	3465*	942	3056	1026	1809	2693	-	1983*	1634
Summer Sweet 7620	3699*	405	1634	492	(1851)	935	-	234	935
Supersweet Jubilee	2562	573	2690	849*	(978)	(625)	-	75*	(400)
BICOLOR									
Confection	4347*	2664	4082	2583*	1284	1991	-	2331*	1634
Eagle	660	(123)	1982	1713*	(1161)	950	-	411	599
Skyline	3261	1635	4268	3444*	(282)	1121	-	3195*	938
Summer Sweet 8102	2583	1635	3548	3264	1297	4085	-	1824	3035
Sweetheart	3114*	2325	3056	3636*	1272	1814	-	1815*	1124
Top Notch	3093	1992	3905	4137*	1464	2162	-	2331*	1628

plastic mulch or row cover. Low profit/A of most cultivars in the second and third planting was largely due to below-average germination rates. Among all cultivars at Windsor, the most successful in April plantings under clear plastic mulch were Summer Sweet 8102 (BC) and Confection (BC).

In the April 22 planting at Mt. Carmel, Confection (BC) had the greatest profit/A in plots covered with clear plastic mulch. Net profit/A exceeding $3,450 was also observed in Summer Sweet 7620 (Y) and Northern Extra Sweet (Y) in plots covered with clear plastic mulch. Although net profit/A of Extra Early Supersweet (Y) and Sweetheart (BC) was somewhat lower than those above, they too benefited from clear plastic mulch because gross returns exceeded total cost. All 11 cultivars planted under floating row cover had profit/A less than those planted in the uncovered control, i.e. yields were insufficient to offset increased production cost. In the uncovered control, profit/A exceeded $4,000 for Northern Supersweet (Y), Skyline (BC), and Confection (BC).

In the April 30 planting at Mt. Carmel, profit/A exceeding $4,100 was observed for Top Notch (BC) in the plot covered with clear plastic mulch. Lower profits/A were also observed for Skyline (BC) and Sweetheart (BC) in plots covered with clear plastic mulch. Again, the net profits/A of

Table 10. Estimated net profit/acre (dollars gross returns less total cost) of yellow and bicolor supersweet corn in late-April to mid-May plantings at a wholesale price of $1.50/dozen ears. Losses are in parentheses. Net profit in covered plots higher than net profit in uncovered plots are marked with an asterisk.

	April 22-23			April 30-May 2			May 8-12		
	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover	Clear Plastic	Row Cover	No Cover
				WINDSOR					
YELLOW									
Extra Early Supswt.	753	(1329)	1466	(468)	(898)	1644	-	(286)	2682
Northern Supswt.	396	(282)	1110	(464)	(634)	1906	1368	1113	1382
Northern Extra Swt.	51	(1152)	420	(464)	(1419)	594	-	243	1550
Summer Sweet 7620	928	506	1553	(114)	(21)	683	-	(717)	(102)
Supersweet Jubilee	584	66	1384	(33)	(364)	1898	-	66	1643
BICOLOR									
Confection	1450	66	2156	236	501	1642	-	754	2596
Eagle	842	(188)	1992	405	680	770	-	(630)	246
Skyline	837	(542)	1902	(291)	(630)	242	-	(1329)	1644
Summer Sweet 8102	2064	1029	2682	928	850	2429	-	(630)	680
Sweetheart	933	(798)	1810	1102	(1328)	1202	-	(1074)	944
Top Notch	495	939	1637	1191	(722)	1295	-	150	1553
				MT. CARMEL					
YELLOW									
Extra Early Supswt.	750*	(1244)	718	(390)	(806)	848	-	(188)	860
Northern Supswt.	582	420	2078	54	(21)	590	-	(452)	590
Northern Extra Swt.	1020	(542)	1216	(200)	(108)	1034	-	(21)	504
Summer Sweet 7620	1137*	(810)	504	(466)	(1938)	155	-	(896)	155
Supersweet Jubilee	568	(726)	1032	(288)	1502)	(625)	-	(975)	(451)
BICOLOR									
Confection	1461	320	1728	579	(370)	683	-	153	504
Eagle	(382)	(1074)	678	144	(1593)	162	-	(807)	(13)
Skyline	918	(195)	1822	1010*	(1154)	248	-	585*	156
Summer Sweet 8102	579	(195)	1462	920	(369)	1730	-	(100)	1205
Sweetheart	844	150	1216	1106*	(1446)	594	-	(105)	250
Top Notch	834	(16)	1640	1356*	(280)	768	-	153	502

all 11 cultivars in plots covered with floating row covers were less than the net profits/A in uncovered plots.

In the May 12 planting at Mt. Carmel, Skyline (BC) had a profit/A exceeding $3,100 in plots covered with floating row cover. Net profit/A of Confection (BC) and Top Notch (BC) exceeded $2,300. Among all cultivars at Mt. Carmel, the most successful in April plantings under clear plastic mulch were Confection (BC) and Sweetheart (BC).

Net profits were also calculated for all cultivars based on a wholesale price of $1.50/dozen ears (Table 10). At Windsor, no cultivars had a net profit from production under clear plastic mulch or floating row covers that exceeded the net profit in uncovered controls. Many cultivars grown under floating row covers had a net loss. The wholesale price of $1.50/dozen ears was not great enough to offset the cost of either cover compared to net profits earned from cultivars grown without cover. Net profit/A exceeded $2,000 in two of three plantings without cover for Confection (BC) and Summer Sweet 8102 (BC).

At Mt. Carmel, net profits/A were low because of poor germination of most cultivars. Net profit/A of Summer Sweet 7620 (Y), Skyline (BC), Sweetheart (BC), and Top

Notch (BC) exceeded $1,000 in at least one planting under clear plastic mulch. Most cultivars in three plantings under floating row covers incurred net losses because of the high cost of material and labor.

To summarize, the greatest opportunity for profit was the use of clear plastic mulch for early plantings of supersweet corn sold at a retail price of $3.00/dozen ears. Opportunity for profit was less for the use of floating row covers, mainly because the expense of the material was high and the yields of many cultivars were lower than the yields in uncovered controls. Profitability for each cultivar was sporadic and often losses occurred.

How could net profit be increased? Increased yields could be attained by assuring the soil moisture was adequate for satisfactory germination. Lower yields were observed in the second and third plantings because soil moisture was not adequate for germination of the shallowly planted seeds. Delay in planting until after a rain event or irrigation after planting may increase stand density, yield, and profitability. Cost reduction could also be achieved if the cover materials could be salvaged and reused another year. Floating row covers, removed after germination was complete (generally after 3 weeks), showed little damage. Damage would be more severe if the row covers remained several more weeks as the plants grow and exert pressure beneath the cover.

CULTIVAR SELECTION. In selecting suitable cultivars for a sweet corn program, one must consider yield potential, quality characteristics that appeal to sight and taste, and their response to soil temperature modification by cover materials to produce early crops that are profitable. No cultivars tested displayed tough kernels when harvested at full maturity. When harvested at full maturity, all cultivars maintained satisfactory sweetness for 8-10 days under refrigeration and 4-6 days at room temperature. Harvest could be delayed 5-7 days following full maturity without loss of quality. Delayed harvest, however, shortens the shelf-life and subjects the mature crop to damage by raccoons and skunks.

For late-April to mid-May plantings, cultivars that responded well to temperature modification by clear plastic mulch were Confection (BC), Summer Sweet 8102 (BC), and Northern Extra Sweet (Y). Their profitability was enhanced by good germination and production of marketable ears. The harvest of Summer Sweet 8102, a late-maturing cultivar, would be about 12 days after the others. Although Summer Sweet 8102 does not provide the earliest harvest, it is a good companion for Confection, an early maturing cultivar, to broaden the harvest from a single planting.

For plantings beyond mid-May without cover, Hill (1997) reported that the bicolor cultivars Confection and Summer Sweet 8102 provided above-average yields in most plantings. Most ears were Grade 1 with excellent tip fill and husk coverage.

For yellow cultivars planted without cover beyond mid-May, Summer Sweet 7620, a late-maturing cultivar, had high yields and excellent quality. Although germination was average or above average in all plantings, production of marketable ears/plant was high. Yield of Northern Extra Sweet was above average in all plantings at both sites. Its ears were the longest and heaviest among all cultivars tested. Supersweet Jubilee had high yields and quality in most plantings but harvest was difficult because of tough shanks.

PLANTING DATES. From studies at Windsor and Mt. Carmel in central Connecticut, clear plastic mulch increased soil temperatures beyond mid-April to produce early crops. To increase profitability, proper cultivar selection is important. Most cultivars can be planted after May 1 because soil temperature no longer limits germination. The succession plantings, 7-10 days apart, did not produce mature crops in a like span of time. Some early-maturing cultivars in the first and second plantings were harvested on the same day in mid-July because the maturity of the second crop shortened as daily temperature increased and daylight was near its maximum. To avoid "bunching" of harvests as the weather warms, scheduling successive plantings using a growing degree day system (Ashley 1998) has proven successful.

In early July plantings, cultivars with early to mid maturity (65-75 days) are preferred. At this time, 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 early June without the use of clear plastic mulch. In May, clear plastic mulch may increase germination and profit for roadside sales.

SPECIAL REQUIREMENTS. Plantings of supersweet corn have special requirements. The shrunken seeds, smaller than normal (su) or sugar enhanced (se) types, should be planted three-fourths to one inch deep. Planted at greater depth, germination is poorer and subsequent yield decreases. Planting in moist soil with temperatures exceeding 60F increases germination. Some newly-released cultivars with increased cool soil tolerance are identified in many seed catalogues.

Supersweet corn must be isolated from all 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 seedsmen recommend a distance of 250 feet between plantings of supersweet corn and other types, i.e. normal sugary (su), sugar enhanced (se), field, pop, and ornamental. Large plantings are well isolated by 500 feet especially if located downwind at windy sites with no tree breaks. Isolation by maturity can be accomplished by separation of 10-14 days between plantings of supersweet corn and other corn types.

White supersweet corn 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 main stem. Occasionally large tillers produce 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, especially if germination was delayed by lack of soil moisture or excessively cool soil temperatures in early plantings.

REFERENCES

Anon. 1989. Connecticut Agricultural Marketing Directory. Connecticut Department of Agriculture, Hartford. 52p.

Anon. 1994. Germination standards for vegetable seeds in interstate commerce. Federal Register Vol. 59. Number 239. Rules and Regulations.

Anon. 1997. 1996 cash receipts. National Agricultural Statistics Service. USDA. 8p.

Ashley, R.A. 1997. Scheduling sweet corn plantings. Proc. 1997 New England Vegetable and Berry Conference. Connecticut Cooperative Extension System. Storrs, CT. 222p.

Bravo-Ureta, B.E., Fuglein, H.V., and Ashley, R.A. 1985. Enterprise budgets for vegetable crops. Cooperative Extension Service, Univ. of Connecticut, Storrs, CT. 85-23. 48p.

Creech, R.G. 1965. Genetic control of carbohydrate synthesis in maize endosperm. Genetics 52:1175-1186.

Ferro, D.N., Bonanno, A.R., Howell, J.C., and Wick, R.L. 1997. 1998-1999 New England vegetable management guide. Univ. of Massachusetts, Amherst, MA. 96p.

Hill, D.E. 1997. Bicolor supersweet corn trials 1995-1996. Conn. Agr. Exp. Sta., New Haven. Bull. 941. 12p.

Laughnan, J.R. 1953. The effect of the sh2 factor on carbohydrate reserves in the mature endosperm of maize. Genetics 38:485-499.

Splittstoesser, W.E. 1979. Vegetable growing handbook. AVI Publishing Company, Westport, CT. 289p.

Wong, A.D., Juvik, J.A., Breedon, D.C., and Schweider J.M. 1994. Shrunken2 sweet corn yield and the chemical components of quality. J. Amer. Soc. Hort. Sci. 119:747-755.

Yamaguchi, M. 1983. World vegetables: principles, production, and nutritive value. AVI Publishing Company, Westport, CT. 415p.

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