1986 Illinois Vegetable Research Report

Research Reports From:

Urbana Campus

Kankakee River Valley Sand Field, Wichert

Horticulture Research Center, St. Charles

Dixon Springs Agricultural Center, Simpson

Department of Horticulture and
Agricultural Experiment Station
University of Illinois at Urbana-Champaign

HORTICULTURE SERIES 62

ILLINOIS VEGETABLE RESEARCH REPORT - 1986

This report presents the results for 1986 of various vegetable-oriented research projects conducted by the Department of Horticulture within the Agricultural Experiment Station of the University of Illinois at Urbana-Champaign. The information contained in this report should not be interpreted as recommendations but as a summary of experimental results. We hope the information presented will be useful when making vegetable management decisions. Additional information of research projects can be obtained by contacting the individual project leader.

Much of the vegetable research that is conducted at the Illinois Agricultural Experiment Station would not be possible without the support of the commercial industries and growers. Thanks and appreciation are due to the agricultural industries, the Illinois Vegetable Growers Association, and the many individual growers who support and participate in these research projects.

Randall K. Lindstrom, Editor

This report was compiled and edited by
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THE ILLINOIS AGRICULTURAL EXPERIMENT STATION PROVIDES EQUAL OPPORTUNITIES IN PROGRAMS AND EMPLOYMENT

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Research Locations

The research contained in this report was conducted at 4 locations covering diverse edaphic and climatological areas in the state. These include the main campus at Urbana, the Kankakee River Valley Vegetable Field at Wichert, the Northeast Horticulture Center at St. Charles, and the Dixon Springs Agricultural Center at Simpson.

The Vegetable Research Farm at Urbana is part of the University's "South Farm" at the Urbana campus in Champaign County. The majority of the soil at the farm is classified as a Drummer silty clay loam. This is relatively heavy soil with approximately 5% organic matter and a cation exchange capacity of 23.5 meq/100 g. There is also at the farm a Flanagan silty loam soil with somewhat similar chemical and physical properties.

The Northeastern Illinois Horticulture Research Center is located 1 mile west of St. Charles (40 miles west of Chicago) on Illinois Rt. 38 in Kane County. The center is located near one of the largest fresh market and processing areas in the state. The soil at the field is primarily a Proctor silt loam. Within the farm however, soil type, chemical, and physical properties vary considerably.

The Kankakee River Valley Sand Field, located 10 miles southeast of Kankakee in northeastern Illinois, is a relatively new research location having been established in 1982. It is located in one of the leading vegetable producing areas in the state near the town of Wichert. The soil at the field is a Maumee loamy fine sand with approximately 2.3% organic matter and a cation-exchange capacity of 7.2 meq/100 g. Irrigation is required and is provided at the site by moveable aluminum pipe.

Dixon Springs Agricultural Center is located in Pope County in the extreme southern tip of Illinois, on State Highway 145, 25 miles southwest of Harrisburg. Horticultural research at Dixon Springs began in 1961. Recent research had been with vegetables and small fruits. The soil is a Grantsburg silt loam, with approximately 1.5% organic matter and a cation-exchange capacity of 12 meq/100g. A moveable aluminum pipe irrigation system supplies water from a pond as needed.

Climatological Data - Illinois 1986*

	Urbana			Wichert			St. Charles			Dixon Springs		
	Max** (F)	Min** (F)	Precip (in)	Max (F)	Min (F)	Precip (in)	Max (F)	Min (F)	Precip (in)	Max (F)	Min (F)	Precip (in)
April	69	40	2.70	68	39	2.00	64	40	1.35	74	48	2.40
May	75	53	5.00	73	48	3.60	70	49	4.05	79	57	10.75
June	84	60	4.28	83	55	5.40	78	56	4.55	87	65	2.84
July	87	67	4.70	87	64	2.95	83	64	4.75	92	70	3.79
August	82	57	1.42	82	55	1.50	78	55	1.05	86	63	4.16
September	81	58	7.90	75	52	4.50	75	54	5.85	88	63	4.30

*Data provided by NOAA (National Oceanic and Atmospheric Administration).
**Maximuma nd minimum temperatures represent monthly averages for each location.

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PREPLANT NITROGEN EFFECTS ON FRUIT SET AND YIELD OF BELL PEPPER

Siti Hassan, John M. Gerber and Walter E. Splittstoesser

The nutritional status of plants is known to be a major factor affecting fruit set in many crops. Of all the nutrient requirements supplied to the soil, nitrogen has been shown to have the most affect on yield. Nitrogen influences reproductive development in pepper (1), since it not only encourages growth of the vegetative parts of plants, it is also necessary for the developing fruit (6). Fertilization with nitrogen is needed since a deficiency may result in failure of fruit set and cessation of fruit development. At higher rates, however, nitrogen fertilizer may cause adverse effects on fruit set, reducing the number of fruits produced per plant (7).

Fertilizer nitrogen has been shown to both increase and decrease yield, depending on the soil type, amount supplied and time of application (3, 4). It has been demonstrated that two nitrogen applications during a growing season (ie. at planting and 3 and 4 weeks after fruit set) can increase the number of buds formed and fruit set. Flower production increases with increasing levels of nitrogen until a physiological maturity is attained in plants (5). After maturity is reached, flower production decreases. Moreover, since flower primordia are differentiated 4 to 6 weeks before the flowers actually appear, the rate and timing of nitrogen application may have direct effect on flower production, as well as fruit set. The amount of nitrogen applied at the time of transplanting can be critical.

The aim of this experiment is to investigate the effect of different levels of nitrogen at transplanting on flowering, fruit set and yield of bell pepper.

Materials and Methods

Location: Vegetable Research Farm, Urbana, IL

Planting material: 'Lady Bell' variety

Planting: Peppers were seeded into flats on 4/7/86 and transplanted to the field on 5/21/86. All nitrogen fertilizer in the form of ammonium nitrate (NH_4NO_3) was broadcasted around plants on the third day after transplanting.

Plot: There were 4 plots per treatment. Each plot consisted of 4 rows with 8 plants per row at a distance of 3' x 3'.

Treatment: 4 levels of nitrogen were tested

1. 100 lb. N per acre, at transplanting
2. 200 lb. N per acre, at transplanting
3. 300 lb. N per acre, at transplanting
4. 400 lb. N per acre, at transplanting

Data:

1. Number of buds produced on 3 plants per plot
2. Percentage of fruit set
3. Number of fruit at first harvest (57 days after transplanting)
4. Number of fruit and total yield for 4 harvests
5. Fresh weight of plant at 3 dates during the season

Results and Discussion

Plant growth is affected by the rate of nitrogen applied at transplanting (Table 1). Generally, the fresh weight of plants decreased as the rate of nitrogen applied at planting increased. An excess amount of nitrogen early in the development of the plant caused adverse effects on growth. Although plants had darker green leaves, those with excessive nitrogen produced less total plant weight plus fruit weight (Table 1). The fresh weight of plants grown with the lowest level of nitrogen was greatest at the end of the growing season compared to plants with excessive nitrogen rates. Higher rates of nitrogen at transplanting did not stimulate vegetative growth, but rather suppressed pepper plant growth. This is not in agreement with some reports that indicate high nitrogen rates promote growth and abundant foliage. The excess amount of nitrogen available to plants at early stages could affect root growth by salt burn, which in turn might reduce the above ground vegetative growth.

Table 1. Fresh weight of plant at 3 sampling dates (gm) as influenced by nitrogen applied at transplanting

Treatment lb. N/acre	Days after transplanting			
	33	63	94	
		Plant Wt.		Final Plant Wt. Plus Total Fruit Wt.
100	57.7	240.6	737.5	2,437
200	52.1	287.5	672.2	2,233
300	45.7	259.5	523.3	2,025
400	47.7	258.2	586.9	2,011

The total number of fruits harvested and the number in the first picking are shown in Table 2. Higher rates of nitrogen at transplanting had a negative effect on fruit number. Since the lower rate of nitrogen at planting produced bigger plants, the total number of fruits per plant harvested may be related to plant size. These large plants are able to supply more food for more fruit to develop. The size of marketable fruit were similar regardless of the rate of nitrogen applied.

Table 2. Early and total marketable fruit yield

Treatment lb. N/ acre	Fruit/Plant		Avg. Fruit Wt. (oz.)
	First Pick	Total	
100	1.9	15.1	3.2
200	1.4	14.0	3.2
300	0.9	13.7	3.2
400	0.8	11.6	3.3

The number of fruit harvested corresponds to the percentage of fruit set. Higher nitrogen rates resulted in a decrease in percentage fruit set (Table 3).

In spite of reduction in fruit set at high nitrogen treatments, the plants may have compensated by producing more flower buds. The average number of buds per plant increased considerably with increasing rates of nitrogen. Doubling the rate from 100 to 200 lbs. increased the bud number from 118 to 143. This indicates that excessive nitrogen at planting promotes bud production, but causes a detrimental effect on fruit set, resulting in a reduction in yield. The plants are not able to supply enough food for fruit to develop, possibly due to smaller plant size.

With statistical tests yet to be performed, evidence shows that excessive nitrogen fertilizer applied at planting causes an adverse effect on growth, as well as fruit set and yield. Higher levels of preplant nitrogen are not recommended since nitrogen causes a decline in fruit set and reduces yield.

Table 3. Flower bud number and percentage of fruit set per plant

Treatment lbs. N/acre	Total Buds[1] (no./plant)	Total Fruit[2]	Percentage Fruit Set (%)
	(no.)	(no.)	
100	118	41.8	35.4
200	143	38.4	26.9
300	129	35.0	27.1
400	145	33.1	22.8

[1]From 3 plants per replicate
[2]Total fruit harvested plus small fruit left on the plant after the harvest

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OVIPOSITION IN THE SQUASH BUG, *Anasa tristis*

Dennis Fielding

The squash bug is a pest of pumpkins and squash throughout Illinois. The bugs overwinter as adults and the females begin ovipositing on squash plants in June. The eggs hatch within 6 to 14 days, depending on the temperature, and the resulting nymphs pass through 5 instars before molting into adults. Chemical control of this pest is directed toward the first or second instars when they are more susceptible to the chemical and before they do much damage. Efficient timing of chemical applications depends in part on knowledge of the timing and duration of oviposition in the field. This study was undertaken to gain information on the number of eggs laid per female bug and the timing and duration of the oviposition season for both the overwintered bugs and for new bugs which have matured from eggs laid by the overwintered generation.

Materials and Methods

Three plants in an approximately 1/2 acre plot of pumpkin (Libby's Select) were inspected for squash bug eggs every 5 to 8 days during the summer. After the eggs in a cluster were counted, the egg cluster was circled with an indelible marker so that only new eggs were counted during subsequent inspections. In this manner, the timing of oviposition in the field was monitored.

To determine the number of eggs laid per female, fifteen pairs of bugs were collected in the field in early June, 1986, before oviposition began. Each pair was confined within a nylon mesh bag on a leaf of a pumpkin plant. Eggs were counted every 5 to 8 days.

To determine the size of the second generation of squash bugs, new adults were examined for eggs at weekly intervals. Each week a large number of fifth instar nymphs were collected and placed in a field cage containing a squash plant. After 4 days, any new adults were removed and placed in nylon mesh bags. Two weeks later, after the females had time to develop eggs, 30 to 40 females were dissected and examined for the presence of eggs. Those without eggs were considered to be entering diapause for the winter.

Ten pairs of bugs which eclosed (hatched) on July 25 were confined in mesh bags and the eggs produced were counted at 5 to 8 day intervals.

Results

The first egg cluster in the field was found on June 13 and the last was found on September 9, a span of almost 3 months (Fig. 1).

Overwintered bugs confined to the bags began ovipositing June 20. The average number of eggs produced per female was 313.8 (Table 1). The last eggs were produced between September 4 and 9 (Fig. 2). Only 2 of the original 15 females survived to September.

Adult bugs began eclosing in late July. Nearly all bugs which eclosed before June 25 produced eggs. Bugs which eclosed after August 5 directly entered diapause (Fig. 3) without producing any eggs.

The new females which eclosed July 25 began ovipositing by August 5 and ended by September 4 (Fig. 2). The average number of second generation eggs produced per female was 101.4 (Table 1).

Table 1. Number of Eggs per Female

	Total eggs	Standard deviation	Maximum	N
overwintered	313.7	142.9	520	15
new bugs	101.4	47.0	186	10

Discussion

The oviposition season lasted for about 88 days, with 90% of the activity occurring within 56 days. A peak of oviposition occurred in late July and early August, reflecting the warm weather and possibly some contribution from new adults. Relatively few adults had eclosed before the August 1 median data for diapause induction and it is expected that in most years these new adults will not contribute very much to the total oviposition in a season.

The long duration of the oviposition season indicates that for 100% control of the nymphs several applications will be necessary. More realistic, however, may be a single spray shortly after peak oviposition, which will not give 100% control but may prevent populations from reaching an economic level.

Dennis Fielding is a Graduate Research Assistant, Section of Economic Entomology, Illinois Natural History Survey.

FIG. 1. Eggs per day on three pumpkin plants.

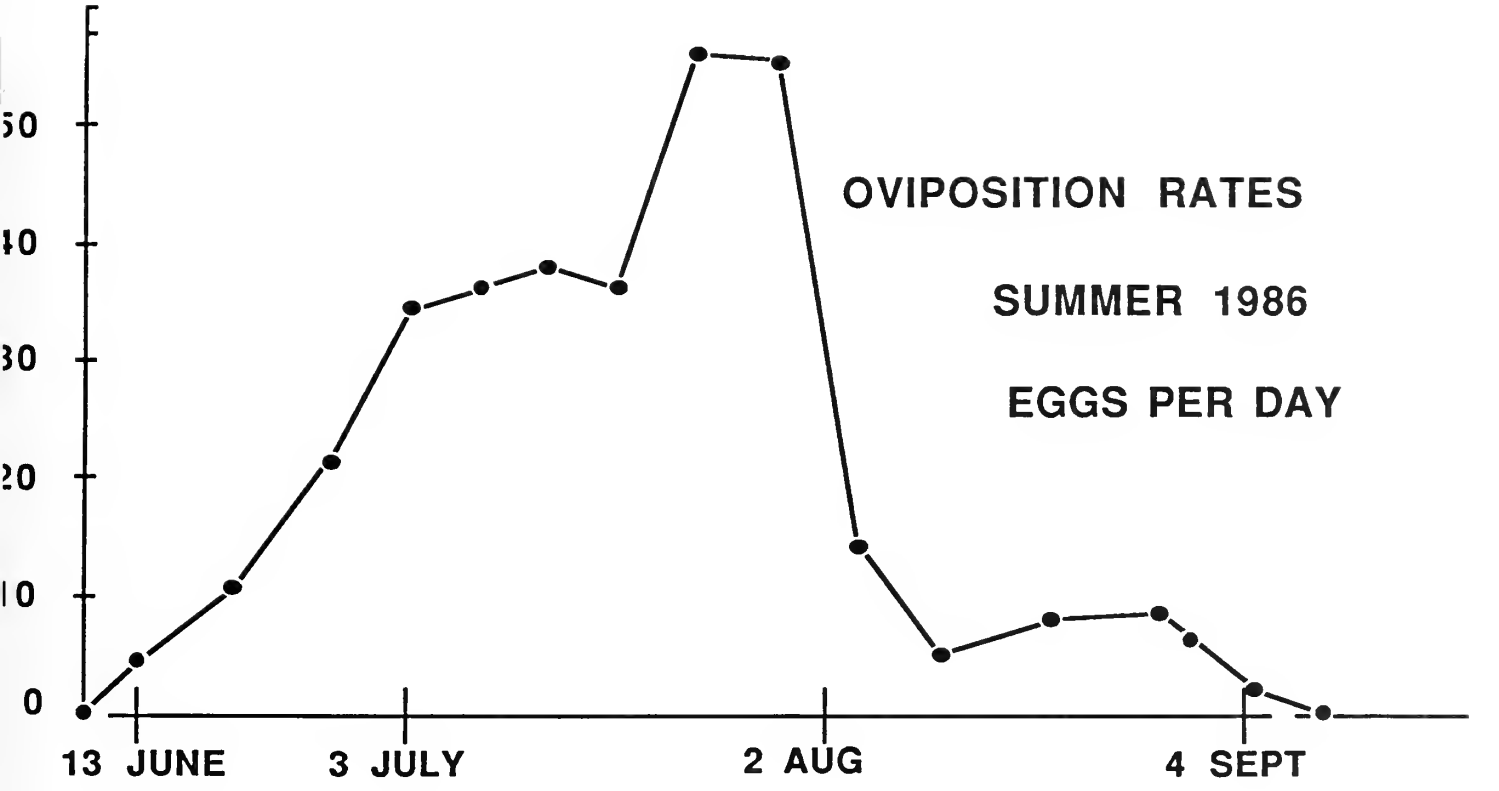


FIG. 2. Oviposition by squash bugs confined in nylon mesh bags.

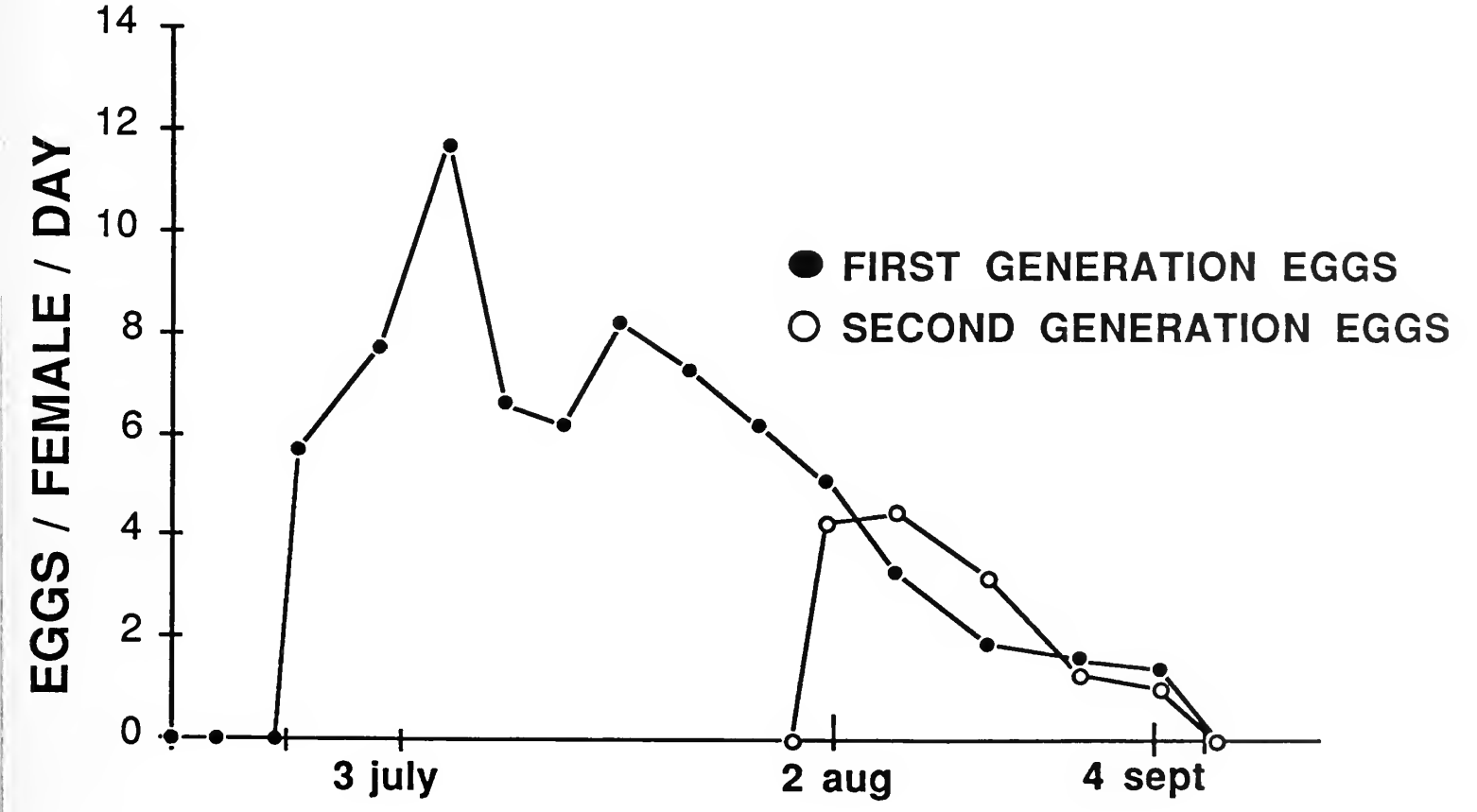
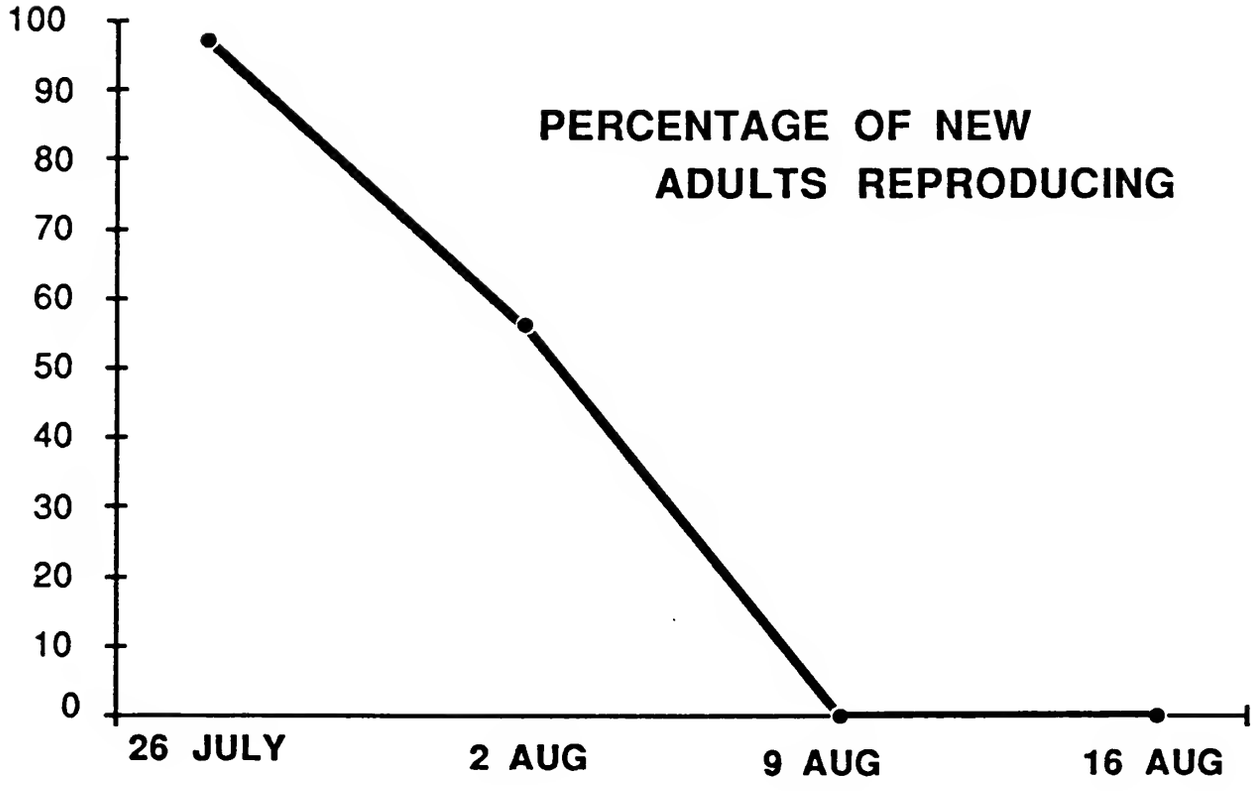


FIG. 3


100
90
80
70
60
50
40
30
20
10
0
PERCENTAGE OF NEW
ADULTS REPRODUCING
26 JULY
2 AUG
9 AUG
16 AUG

BEDS AND SEED TREATMENTS FOR BELL PEPPERS

William H. Shoemaker

Establishing a plant population is perhaps the most difficult step in the process of raising a crop. Whether to direct-seed or transplant depends on many considerations. In northern Illinois, bell peppers are traditionally transplanted for several reasons. A six-to-eight week old transplant can be set in the field almost as soon as a direct seeding can take place. This gives the farmer an earlier crop. Also, transplants can be selected for vigor and placed accurately, giving the grower the exact plant stand he needs. A drawback of transplanting however is the cost of producing the plants. If a grower can be assured of an accurate plant stand without overseeding and then thinning, direct-seeding could become more attractive, particularly if the grower could be assured of vigorous growth.

Several seed companies have begun marketing seed products that are described as "enhanced" or "vigorized". The point is that, through several techniques, the seed product has been selected or treated to provide superior performance. With the cooperation of Asgrow Seed, their vigorized seed product was tested in 1986 at the St. Charles Horticulture Research Center.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Plot Layout: Each treatment was a single 12' row planted on an 18" bed, 6" high. Guard rows were used and treatments were replicated four times.

Planting: Each treatment was direct seeded with a hand jab planter at 3/8" to 1/2" depth, spaced at 6"/seed on June 6. The beds had been established for six weeks.

Treatments: Four treatments were used, consisting of:

1) Seed coated and vigorized
2) Seed coated but not vigorized
3) Seed not coated but vigorized
4) Seed neither coated nor vigorized

The cultivar used was 'Yolo Wonder'.

Fertility: Applications of N, P and K were made at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb P04/A as 18-46-0
K at 125 lb K20/A as 0-0-62

Fertilizer broadcast commercially preplant and incorporated.

Weed Control: Treflan 4E at 0.75 lb aia, ppi, double-disced. Hand-weeding as needed.

Insect Control: Only one insect pest was a problem. It remains to be identified. It was a general feeder and was controlled with several sprays of Sevin at 1.0 lb aia.

Disease Control: No disease problems were noted.

Irrigation: No irrigation was provided. Rainfall was sufficient during the first eight weeks.

Harvest: A single, once-over harvest of mature green fruit.

Data: Average of 4 replications, 12' of row with a maximum of 24 plants.

Results and Discussion

Conditions during germination and early growth were good, with light rainfalls supplying adequate additions to a good soil moisture situation. Weed control was fair at best, only because the weed control material selected did not target the weed which became the only problem, velvetleaf. Hoeing kept weed pressure down to reasonable levels and presumably prevented any significant impact on the plot. Because of the late planting and direct-seeding, a much cooler than normal August prevented development of a fully mature crop, although a harvest did occur. A severe drought in August also contributed to a small crop.

Effect on Plant Stand

See Table 1 for plant stand date.

Observation and measurement of germination and early growth revealed an obvious difference between those treatments that were vigorized and those which were not. Cotyledon size in the vigorized treatments was larger, both in width and length of the leaves. Plants in the vigorized treatments emerged earlier and more uniformly (less time between first and last emergence in a row). Rate of emergence differences are clearly illustrated as significant in Table 1 as are total numbers of emerged seedlings. No significant differences were seen between coated and uncoated seeds.

Table 1. Plant Stand at Three Weeks

Treatment	Total % of Emerged Seedlings	% of Seedlings with True Leaves Unfurled	Seedlings Still Emerging
Uncoated, Unvigorized	18.0 (1.0)*	0.0 (0.0)	5.25 (2.75)
Coated, Unvigorized	16.25 (1.75)	0.25 (0.38)	2.75 (0.75)
Uncoated, Vigorized	21.25 (1.75)	13.75 (0.88)	0.5 (0.5)
Coated, Vigorized	21.0 (0.5)	12.5 (1.75)	0.75 (0.38)

Effect on Yield and Quality

See Table 2 for harvest data.

Certainly the difference between vigorized and unvigorized seed emergence was significant. The question remains whether the significant effect is maintained through harvest. In this case the difference was not statistically different (see Table 2 for harvest data). However, poor growing conditions in the latter part of the growing season may have contributed to the variability. In terms of averages, there were clear differences in yield. There was also a visible difference in size of the plants at harvest time, though it was slight.

Summary

Results of this year's work indicate that the vigorizing process used by Asgrow certainly has a positive impact on stand establishment. Though the impact didn't carry through to the harvest period, future work should be carried out to determine whether these results will be found consistently. The positive effects of vigorized seeds may make direct-seeding more attractive to the pepper grower. Vigorized seed may also be attractive to the greenhouse operator, providing a better opportunity to keep growing trays full.

The author would like to acknowledge the assistance of Todd Cutting of Asgrow Seed Co., Kalamazoo, MI and Rusty Leffingwell of Befco Equip., Fairbury, IL.

Table 2. Harvest Data

Treatment	No. of 4-lobed	Wt. of 4-Lobed Fruit	No. of Other Fruit	Wt. of Other Fruit	Total No.	Total Wt.	No. of BER* Fruit	No. of Other Culls
Unvigorized-Uncoated	5.25	1.18	3.25	0.73	7.75	1.9	0.75	0.5
	(2.5)**	(0.8)	(2.3)	(0.6)	(4.8)	(1.3)	(0.8)	(0.5)
Unvigorized-Coated	4.75	1.08	3.0	0.75	7.75	1.83	0.25	1.0
	(4.1)	(0.9)	(1.5)	(0.5)	(4.1)	(1.0)	(0.4)	(0.5)
Vigorized-Uncoated	9.75	1.8	5.75	1.30	15.5	3.4	1.25	1.75
	(5.1)	(0.8)	(2.6)	(0.6)	(2.5)	(0.4)	(0.9)	(0.9)
Vigorized-Coated	10.25	2.0	7.75	1.70	18.0	3.7	0.75	1.0
	(2.8)	(0.6)	(4.8)	(1.2)	(7.5)	(1.7)	(0.6)	(1.5)

*Blossom end rot
**Indicates variance figures for each average.

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SEASONAL GROWTH AND COMPOSITION AND ACCUMULATION OF N-P-K IN DRYLAND AND IRRIGATED PUMPKINS

John M. Swiader

Nutrient uptake patterns and how they change as plants develop can be used to determine crop fertility needs at various stages of plant growth. This type of information is especially appropriate in pumpkin (Curcubita moschata Poir) since there are several distinct and very different growth phases during the life of the plant. Fertility needs of pumpkin are particularly important during the later growth stages when photosynthates are being accumulated rapidly in the fruit, placing added demand on the root and shoot system for mineral nutrients.

To date, no attempts to quantify total nutrient demand and nutrient removal in harvested pumpkin fruit have been reported in the literature. The purpose of this research was to characterize dry matter production as well as the accumulation and composition of N, P, and K in various plant parts for 5 stages of development in dryland and irrigated pumpkins.

Materials and Methods

This research was conducted for two years on a Flanagan silty clay loam (fine, montmorillonitic, mesic, Agric Argiudolls) at the University of Illinois Vegetable Research Farm at Urbana. The Flanagan soil is considered a relatively fertile soil (cation-exchange capacity of 23.8 meq/100 g, 4.5% organic matter content, 112 kg P/ha, 215 kg K/ha) with moderate to high moisture holding capacity (field capacity 26.4%, permanent wilting point 13.3%).

Moisture regimes consisted of no irrigation (dryland culture) and supplemental irrigation to prevent the available soil moisture from falling below 50%. Soil water potential was determined from tensiometers randomly placed throughout the plots. Water was applied in 0.5 inch increments by overhead sprinkler irrigation. Irrigation frequency was 9 applications in 1983 and 5 applications in 1984. Moisture regimes were randomized with 5 replications of dryland pumpkins and 4 replications under irrigation.

Within each moisture regime, pumpkin cultivar 'Libby Select' was seeded in hills at 30 inch intervals in double rows 5 feet apart and 46 feet long. Prior to seeding, fertilizer to furnish lbs/A rates of 125 N, 100 P_2O_5 and 100 K_2O was incorporated to a depth of 6 inches. When plants developed 2 true leaves, hills were thinned to 2 plants. At specific growth stages corresponding to vine initiation, first female flower, and early, mid, and late-fruiting, 6 plants (3 hills) were harvested in each plot. The early-fruiting stages were identified by a fruit size of 3 inches, mid-fruiting 17 days later, and late-fruiting at the time when approximately one-half of fruit surface color changed from green to tan.

The harvested plant samples were separated into vines, leaves, and fruit, dried at 160°F and weighed. Tissue subsamples were analyzed for total N by a modified micro-Kjeldahl procedure and K following wet

digestion with concentrated HNO_3 and 30% H_2O_2. Duplicate samples were made for all elements. Total uptake of N, P, and K in the various plant organs was calculated by multiplying N-P-K concentrations by the respective total dry weight.

Variation in plant dry matter production in irrigated ($p = 0.66$) and dryland ($p = 0.87$) pumpkins between years was very small. Data are therefore presented as means for the two years.

Results and Discussion

Results on seasonal dry matter accumulation and distribution, and accumulation and composition of N, P, and K are presented in Tables 1-4. Seedling germination and emergence at both locations was fairly uniform. Throughout the study, plants appeared healthy and vigorous with no signs of nutrient deficiency.

In both moisture regimes, maximum rates of dry matter accumulation occurred between the early and mid-fruiting developmental stages. Higher total dry matter production with irrigated than dryland culture was primarily associated with increased shoot growth.

Concentrations of N, P, and K in foliage generally decreased as pumpkin age increased. Irrigated pumpkins in conjunction with higher total vegetative dry matter accumulated more N, P, and K than dryland pumpkins. Up through early fruit development, N, P, and K accumulation was primarily in leaves and vines and by the later growth stages was almost entirely in the fruit. For a population of 3500 plants per acre, total N, P, and K uptake at late-fruiting was estimated at 195, 29, and 204 lbs/A for irrigated pumpkins and 161, 19, 158 lbs/A in dryland pumpkins. Approximately 58% of the N, 52% of the K, and 68% of the P accumulated by late-fruiting was absorbed by the plant after the early-fruiting stage in both moisture regimes. Potassium redistribution from vegetative tissues during late fruit development decreased foliar K contents 32% in dryland pumpkins and 21% in irrigated pumpkins. Translocation of N and P from leaves to fruits was not a significant factor in either moisture regime.

Table 1. Dry Weight Accumulation and Distribution at Five Growth States for Dryland and Irrigated Pumpkin

Plant Part	Dry Weight (g/plant)				
	Vine-stage	Female flower	Early-fruit	Mid-fruit	Late-fruit
			--Dryland culture--		
Vine	6.56	31.06	91.76	119.08	140.62
Leaf	9.82	33.20	119.46	229.03	246.63
Fruit	--	--	29.90	135.24	415.98
Total	16.38	64.26	241.12	483.35	803.23
			--Irrigated culture--		
Vine	5.72	26.86	94.54	140.03	154.69
Leaf	8.73	31.78	179.97	369.36	419.12
Fruit	--	--	42.63	169.29	482.87
Total	14.45	58.64	317.14	678.68	1056.78

Table 2. Nitrogen Composition and Accumulation at Five Growth Stages for Dryland and Irrigated Pumpkin

Plant part	N Compostion (%)					N Accumulation (g/plant)				
	Vine-stage	Female flower	Early-fruit	Mid-fruit	Late-fruit	Vine-stage	Female flower	Early-fruit	Mid-fruit	Late-fruit
				--Dryland culture--						
Vine	4.69	4.08	3.73	3.33	3.04	0.31	1.27	3.42	3.97	4.27
Leaf	5.43	5.16	4.44	3.90	3.66	0.53	1.71	5.30	8.93	9.03
Fruit	--	--	3.07	2.81	2.63	--	--	0.92	3.80	10.94
Total	--	--	--	--	--	0.84	2.98	9.64	16.70	24.24
				--Irrigated culture--						
Vine	4.31	4.11	3.57	3.07	2.78	0.25	1.11	3.38	4.30	4.30
Leaf	5.17	4.81	4.79	3.73	3.38	0.45	1.53	8.61	13.78	14.17
Fruit	--	--	2.77	2.71	2.29	--	--	1.18	4.59	11.06
Total	--	--	--	--	--	0.70	2.64	13.17	22.67	29.53

Table 3. Potassium Composition and Accumulation at Five Growth Stages for Dryland and Irrigated Pumpkin

Plant part	K Composition (%)					K Accumulation (g/plant)				
	Vine-stage	Female flower	Early-fruit	Mid-fruit	Late-fruit	Vine-stage	Female flower	Early-fruit	Mid-fruit	Late-fruit
					--Dryland culture--					
Vine	4.85	4.93	5.23	3.95	2.34	0.32	1.53	4.80	4.70	3.29
Leaf	4.44	4.51	4.53	3.56	2.19	0.44	1.50	5.41	8.15	5.40
Fruit	--	--	3.89	3.58	3.65	--	--	1.16	4.84	15.18
Total	--	--	--	--	--	0.76	3.03	11.37	17.69	23.87
					--Irrigated culture--					
Vine	5.02	5.14	4.97	4.09	3.08	0.29	1.38	4.70	5.73	4.76
Leaf	4.58	4.77	4.70	3.70	2.55	0.40	1.52	8.46	13.76	10.69
Fruit	--	--	3.40	3.51	3.16	--	--	1.45	5.94	15.26
Total	--	--	--	--	--	0.69	2.90	14.61	25.34	30.71

Table 4. Phosphorus Composition and Accumulation at Five Growth Stages for Dryland and Irrigated Pumpkin

Plant part	P Composition (%)					P Accumulation (g/plant)				
	Vine-stage	Female flower	Early-fruit	Mid-fruit	Late-fruit	Vine-stage	Female flower	Early-fruit	Mid-fruit	Late-fruit
					--Dryland culture--					
Vine	0.30	0.31	0.33	0.24	0.19	0.02	0.10	0.30	0.29	0.25
Leaf	0.46	0.37	0.40	0.33	0.28	0.05	0.12	0.48	0.76	0.70
Fruit	--	--	0.50	0.44	0.46	--	--	0.15	0.60	1.91
Total	--	--	--	--	--	0.07	0.22	0.93	1.65	2.86
					--Irrigated culture--					
Vine	0.37	0.40	0.41	0.33	0.29	0.02	0.11	0.39	0.46	0.45
Leaf	0.57	0.50	0.46	0.43	0.38	0.05	0.16	0.83	1.59	1.60
Fruit	--	--	0.52	0.54	0.48	--	--	0.22	0.91	2.32
Total	--	--	--	--	--	0.07	0.28	1.44	2.96	4.37

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ROW COVER MANAGEMENT STUDY OBSERVATION

William H. Shoemaker

Use of row cover materials to improve plant growth and increase crop yields has become well known among vegetable growers. Success stories are repeated often where vegetable growers meet and in the vegetable industries' news publications. The noise of success has to a degree drowned out the complaints of growers whose initial attempts have failed. The number of these failures isn't insignificant. This points to the need for more accurate information on managing row cover use. This study is an attempt to gather more information on the effects of varying weather patterns on row cover use.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: Broccoli

One double row 40' long, plants 1.5' apart and staggered, 4' between row centers, unreplicated.

Tomato

One row 40' long, plants 2' apart with 5' between rows, unreplicated.

Muskmelon

One row 40' long, plants 2' apart with 6' between rows, unreplicated.

Planting: Seeds were set in the greenhouse in Pt72 Pro-Trays with a peat-like mix for tomato and broccoli. Muskmelons used Pt50 Pro-Trays. Date of seed set was March 28 for tomato and broccoli and April 18 for muskmelon. Plants were set in the field on May 15 with a commercial transplanter.

Treatments: Kimberly Farms polypropylene 5' row cover was used in the following time spans for each vegetable:

1) 2.0 weeks
2) 3.5 weeks
3) 5.0 weeks
4) 0.0 weeks

Cultivars: Tomato - 'Pik-Red'
Broccoli - 'Green Comet'
Muskmelon - 'Gold Star'

Fertility: N, P and K were applied commercially at the following rates and disced in:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb PO4/A as 18-46-0
K at 125 lb K20/A as 0-0-62

Starter solution was used at planting, 9-45-15.

Weed Control: In the broccoli and tomatoes, Treflan 4E at 0.75 lb aia, ppi, was applied and double disced. In the muskmelons a tank mix of Prefar 4E at 4.0 lb aia and Alanap L at 2.0 lb aia was applied ppi and double disced. Hand weeding was used when necessary to prevent weed pressure in the plots.

Insect Control: Furadan 15G was applied at planting in a band on the row at 1.0 lb/1500' of row in the muskmelons. In all plots Sevin 80W was used as needed to prevent insect damage. A high pressure boom sprayer was used.

Disease Control: In the broccoli no disease problems occurred. In the tomatoes and melons a spray program was initiated at fruit set which alternated sprays of mancozeb and Bravo at labelled rates weekly. Benlate was used when needed for Septoria Leaf Blight in the tomatoes and Powdery Mildew in the melons.

Irrigation: None was used.

Harvest: The broccoli was once-over harvested at peak maturity. The melons and tomatoes were harvested by hand as the fruit matured until harvest was complete.

Results and Discussion

For the second year in a row conditions were less than optimum for the study of row cover use on vegetables. Warmer than normal temperatures prevailed from the beginning of April to the middle of June, when a cool period reigned for a couple of weeks. Visible plant growth differences were observed in each vegetable however, indicating that whether for better or for worse, row covers have a significant impact on the micro-environment of the plant.

Broccoli Plant growth increased under the row covers as compared to the uncovered plants but in the case of the 5.0 and 3.5 week treatments, this was not beneficial. Plant growth exceeded the amount of space available, causing the plant to distort. These distortions were particularly severe in the 5.0 week treatment, although neither

treatment grew out of the distortions. A longer seasoned crop might have been able to. Plants in the 2.0 week treatment seemed undisturbed by the row covers. Plant growth was similar to the 0.0 week treatment.

Tomato — Plant growth in the row cover treatments increased over the 0.0 week treatment corresponding to the duration of the treatment. However, it seemed that even though an attempt to harden off the plants was made by slitting open the tops several days before removal of the covers, the plants took a week or so to begin growing again. In any case, differences seen in plant growth were not reflected in the harvest data.

Muskmelon — Melons seem to be the one crop that rarely fails with row cover use and this year was no exception. At the end of 5.0 weeks when all row covers were removed, plant growth was visibly enhanced in all treatments and the longer the use of a cover, the greater growth of the plants. No adverse effect was found from using the cover.

Harvest

Broccoli — See Table 1 for harvest data.

Very little difference could be seen in the harvest data. Although the plants were still distorted in treatments 2 and 3, yields were very similar, as was quality.

Tomato — See Table 2 for harvest data.

Some slight differences can be seen in this data but they do not point to a benefit from row cover use. Treatments 1 and 4 were the highest yielding plots with treatment 2 close behind. Treatment 3 was significantly below the yields of the other three treatments, indicating a possible setback from the row cover experience. Average fruit size also decreased the longer the duration of cover. There was no difference in earliness.

Muskmelon — See Table 3 for harvest data.

Harvest figures for the melons fell right in line with the observations on plant growth at row cover removal. Although there was no difference between treatments 1, 2 and 4 in total yield, treatment 3 more than doubled the number of fruit of the other treatments. There was no difference in fruit size but each row cover treatment preceded the check in first harvest by one week.

Table 1. Broccoli Harvest Data

Treatment	No. of Heads	Total Wt. (lb)	Ave Head Wt. (lb)	Ave Head Diameter
1	52	40.3	0.8	7.75
2	57	53.8	0.9	7.95
3	52	37.3	0.7	7.95
4	47	44.5	0.9	7.80

Table 2. Tomato Harvest Data

Treatment	No. of Fruit	Total Wt. (lb)	Ave Fruit Wt. (lb)	Date of First Harvest
1	375	150.9	0.40	7/29
2	316	115.7	0.37	7/29
3	189	66.3	0.35	7/29
4	359	147.7	0.41	7/29

Table 3. Muskmelon Harvest Data

Treatment	No. of Fruit	Total Wt. (lb)	Ave Fruit Wt. (lb)	Date of First Harvest
1	19	62.1	3.3	7/28
2	23	80.2	3.5	7/29
3	62	216.5	3.5	7/28
4	25	84.0	3.4	8/4

Summary

This is in no way a conclusive test of row covers. It rather points to the difficulty in managing them. Further research of currently available materials and further development of new ideas are both necessary to make row covers widely adaptable in vegetable crop production.

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CONTROL OF EASTERN BLACK NIGHTSHADE (SOLANUM PTYCANTHUM) IN TOMATOES WITH POSTEMERGENCE APPLICATIONS OF BLAZER

John B. Masiunas

Eastern black nightshade (Solanum ptycanthum) in Illinois is a problem weed in soybeans and tomatoes. It is tolerant to the common herbicides, Treflan and metribuzin (Lexone or Sencor), used in these crops. Also, growth characteristics of eastern black nightshade cause it to be troublesome. Nightshade remains green after crop maturity, thus, interfering with harvest. Increased light penetration occurring following crop maturity, stimulates growth of nightshade further magnifying harvest difficulties. Since eastern black nightshade can germinate, flower, and fruit within 6 weeks, emerging seedlings must be controlled through the end of July to prevent berry production. A single eastern black nightshade plant can produce as many as 7000 berries and 800,000 seeds in a season, substantially increasing weed control problems the following year.

Blazer (acifluorfen), is used postemergence in soybeans to control eastern black nightshade plant with less than 8 true leaves. Research also has indicated that Blazer at 1/4 to 3/8 lb/A can be used to control eastern black nightshade in tomatoes, provided that the crop is substantially larger than the weed. But, the safety of postemergence applications of Blazer to tomatoes still needs to be determined. The purpose of this study is to determine if the timing of applications of Blazer influence nightshade control or tomato quality and yield.

Materials and Methods

Location: Darrell Pfeiffer Farm, Forest City

Planted: mid-April

Replications: Three

Plot size: 50 square feet (10 feet of row)

Applications: June 23, July 3, 7, 14 and 21. Blazer was applied at 1/4 and 3/8 lb/A (1 and 1 1/2 pt./A respectively) with a CO_2 backpack sprayer and single nozzle boom (8004 nozzle), calibrated to deliver 26 gpa at 30 psi.

Data taken: Weekly tomato and nightshade phytotoxicity ratings on a scale of 0 = no injury, and 100 = complete foliar death. At harvest, percent marketable fruit, fruit size, and total fruit weights were determined.

Average weed density: 4 plants per square foot within the row of tomatoes.

Results and Discussion

Eastern black nightshade germinated in a flush at the end of May, with little germination occurring thereafter. Applications of Blazer caused up to 50 percent phytotoxicity when applied in late June (Table 1). The injury was greatest when Blazer was applied in hot (over 90°F) humid conditions (Table 2). Later applications, in July, were made when temperatures were in the 70's and they did not cause as great injury to tomatoes. Injury that did occur consisted of shoot tip dieback, leaf spotting, blossom drop, and fruit injury. Although tomato regrowth occurred within a week after treatment, the foliar injury would provide a route of entry to pathogens and increase disease control problems.

Table 1. Tomato injury rating (% foliage injured) on July 21.

Blazer Rate	Treatment Date				
	June 23	July 3	July 7	July 14	July 21
Hand weeded	----------	----------	0a1/	----------	----------
1/4 lb/A	45c	15ab	33bc	18b	0a
3/8 lb/A	47c	10ab	18b	22c	0a

1/ Those numbers not containing a common letter are not significantly different at the 5% level by Duncans Multiple Range Test.

Table 2. Environmental conditions and plant size at time of application.

	Treatment Date				
	June 23	July 3	July 7	July 14	July 21
Air Temp. (°F)	92	70	75	75	85
Soil Temp. (°F)	85	78	84	70	75
Wind Direct.	SW	SSW	SSE	SSE	NW
Wind Speed (mph)	0-10	0-5	0-10	0-10	5-10
Soil Moisture	Adeq.	Adeq.	Adeq.	Wet	Wet
Tomato Plant Size(in.)	12	12-16	18-24	18-24	18-24
Tomato Stage	Flower.	Fruit.	Fruit.	Ripen.	Sencence
Nightshade Size(in.)	8-14	12-81	12-24	18-30	18-30
Nightshade stage	Veget.	Flower.	Fruit.	Fruit.	Fruit.

Control of the eastern black nightshade was poor, because plants were too large to be killed by Blazer. Blazer at 1/4 or 3/8 lb/A only controls eastern black nightshade that has less than 4 true leaves. If Blazer was applied in late May, immediately after the majority of eastern black nightshade germinated, control would have been better. At harvest (August 8), approximately 50% of the eastern black nightshade were controlled. The best control was obtained with either the earliest application of Blazer, where the least regrowth of nightshade occurred, or the last application of Blazer, where the least regrowth of nightshade occurred, or the last application of Blazer, where nightshade did not have time to regrow (Table 3).

Table 3. Eastern black nightshade control (% of weed free plots) on August 8, from postemergence applications of Blazer.

Blazer Rate	Treatment Date				
	June 23	July 3	July 7	July 14	July 21
1/4 lb/A	53[1]/	47	43	36	50
3/8 lb/A	60	27	50	38	63

1/ Data is not statistically significant.

Blazer had no significant effect on total fruit weight or, percentage of fruit marketable. Total fruit weight (in lbs per 10 ft of row) ranged from 75 lbs for plots treated with 3/8 lb/A of Blazer on June 23, to 122 lbs for plots treated with 1/4 lb/A of Blazer on July 3, with the hand weeded (weed free) plots averaging 106 lbs (Table 4). Approximately 60% of the fruit produced was marketable. Plots with the lowest percentage of marketable fruit were those treated with 3/8 lb/A of Blazer on June 23, while the highest percent marketable fruit was obtained on plots treated with 3/8 lb/A of Blazer on July 21 (Table 5). There was a significant effect of herbicide treatment on fruit size, with the average fruit size in plots treated with Blazer being 2 1/4 ounces, while the size in the hand weeded (weed free) control was 2 1/2 ounces. This larger size was probably caused by the lack of adequate eastern black nightshade control in Blazer treated plots. The date of Blazer treatment did not effect fruit size.

Table 4. The effect of Blazer treatment on total tomato fruit production (lbs per 10 ft of row).

Blazer Rate	Treatment Date				
	June 23	July 3	July 7	July 14	July 21
0	----------	----------	----------	106[1]/ ----------	
1/4 lb/A	99	122	103	107	97
3/8 lb/A	75	111	102	99	108

[1]/ Data is not significantly different

Table 5. Percentage of total fruit marketable.

Blazer Rate	Treatment Date				
	June 23	July 3	July 7	July 14	July 21
0	----------	----------	63[1]/	----------	----------
1/4 lb/A	61	61	71	66	67
3/8 lb/A	51	59	65	59	67

[1]/ Data is not significantly different.

Although Blazer had no significant effect on fruit weight or percentage of marketable fruit, it provided inadequate control of eastern black nightshade, and caused substantial foliar injury to tomatoes. Tomato plants regrew from this injury, but the amount of injury that occurred was unacceptable. Thus, further research is required to study alternative methods of controlling eastern black nightshade, and to determine factors influencing tomato tolerance to Blazer.

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ROW COVER MANAGEMENT STUDY ON BROCCOLI, TOMATOES AND MUSKMELONS

John M. Gerber

Vegetable growers using plastic row covers and tunnels for the first time often do not see the increased yields that are achieved in research plots. Whenever a new technology is implemented, additional cultural changes are usually required in order to realize the potential of the new technology. Also, management decisions on how the new technology is employed will dramatically impact success.

Row covers can be used to provide earlier and increased yields on some vegetable crops (1,2,3,4,6,7). They have also been shown to provide an economic benefit to grower/marketers depending on the crop, sale price, and yield (5). Successful application of this new technology is dependent, however, on choosing an appropriate planting date, and deciding when to remove the cover. The purpose of this study was to investigate application and removal management of a spunbonded plastic row cover and its effect on plant growth and yield. This experiment was replicated at 4 other locations in the U.S. as part of national research project funded in part by the Kimberly-Clark Corporation.

Materials and Methods

Location: Urbana Vegetable Research Farm

Soil type: Drummer silty clay loam

Crops:

A. Tomato var. 'Pik Red' (Harris Moran)
B. Broccoli var. 'XPH 5002' (Asgrow)
C. Muskmelon var. 'Gold Star' (Harris Moran)

Treatments:

E0 - Early planting, no cover
E2 - Early planting, cover removed after 2 weeks
E3.5 - Early planting, cover removed after 3.5 weeks
E5 - Early planting, cover removed after 5 weeks

L0 - Later planting, no cover
L2 - Later planting, cover removed after 2 weeks
L3.5 - Later planting, cover removed after 3.5 weeks
L5 - Later planting, cover removed after 5 weeks

Schedule:

Seeding:

Tomato and broccoli - seeded on 3/21 for early planting (E series) and on 3/28 for late planting (L series).

Melon - seeded 4/11 for early planting (E series) and 4/17 for late planting (L series).

Planting:

Early Planting - All crops were transplanted to the field on 5/2. This is the date at which there is still a 50% chance of frost at this location.

Later planting - All crops were transplanted to the field on 5/13. This is 2 weeks after the date at which there is a 50% chance of frost.

Plot:

Tomato and melon - each plot is 40 feet long and 5 feet apart with plants spaced 2 feet apart in the row (20 plants per plot).

Broccoli - each plot is 40 feet long and 4 feet apart with two rows of plants spaced 18" apart (40 plants per plot).

All of the plantings were made on 3 ft. wide black plastic mulch. Number 9 wire hoops were spaced at 6 ft. intervals to hold the row cover off the plants. The row cover used in this study was the Kimberly Farms Row Cover. This is a spunbonded polypropylene fabric made for agricultural uses. The plots were irrigated to provide at least 1" of water per week when there was less than 1" of natural rainfall. Fertility and pest control was according to grower recommendations for these crops.

Results and Discussion

Tomato:

Row covers increased the plant weight measured at the last cover removal date which was 5 weeks after planting. Leaving the covers on for longer periods of time increased weight except for the five week treatment on the later planted tomatoes (L5). These were observed to be pushing against the covers for about a week before the cover was removed (Table 1).

When the tomatoes were planted early in the season, row covers increased early yield of saleable fruit but caused a slight reduction in average fruit size. There was no major effect on total yield, although a slight reduction in fruit size was again noted. Leaving the covers on longer than 2 weeks had no measurable effect on yield in the early planting (Table 1).

Removal time for the later planting was more critical. Two week protection improved early yield without hurting fruit size. However, longer covering times seemed to reduce yield (Table 1).

Table 1. Effect of time of row cover treatment on yield of early and later planted tomatoes.

	Plant Weight (lbs.)	Total Yield Fruit/Plant (No.)	Total Yield Fruit Wt. (oz.)	Early Yield Fruit/Plant (No.)	Early Yield Fruit Wt. (oz.)
E0	0.3	22.6	9.0	5.0	8.5
E2	0.7	26.0	7.4	10.4	7.6
E3.5	1.0	24.0	7.3	10.6	7.1
E5	1.6	22.0	8.0	10.0	7.7
L0	1.5	25.4	8.0	4.7	7.8
L2	2.0	26.4	7.2	6.8	8.2
L3.5	2.6	25.6	8.1	5.7	8.4
L4	2.0	27.5	6.7	3.8	6.2

Avg. weight from 4 plants 5 weeks after planting.
Total of 6 harvests from 7/21 - 8/20.
Total of 3 harvests from 7/21 - 7/29.

Early planting and use of row covers on tomatoes might prove to be a useful tool, if the optimum time for cover removal could be predicted. In 1986, leaving the covers on 'Pik Red' tomatoes for just two weeks improved early yield, regardless of planting date. If the covers are left on too long, total yield might be reduced and fruit size may suffer. Since each season will be different, a degree day (heat unit) system to predict optimum removal time might improve the reliability of row covers.

Broccoli:

Row covers increased the size of the broccoli plants at the last cover removal date (5 weeks after planting). Rapid plant growth early in the season results in larger plants which are more likely to produce marketable heads at harvest. Covers used on the earlier planting increased head size and weight when they were left on for up to 5 weeks. The covers had a negative effect on head size when left on the later planting for longer than 2 weeks (Table 2).

Row covers were successful in increasing the early growth rate of broccoli plants and improving head size. Although time of removal is important, it may be less critical than on tomatoes. The covers did not result in an earlier harvest of mature heads.

Table 2. Effect of time of row cover treatment on yield of early and later planted broccoli.

	Plant Weight (lbs.)	Head Weight (oz.)	Head Diameter (in.)
E0	1.2	12.2	5.8
E2	1.4	17.5	7.1
E3.5	1.6	20.4	7.3
E5	2.0	21.8	7.7
L0	2.2	22.1	6.3
L2	2.1	27.4	7.0
L3.5	2.3	25.6	6.7
L5	2.3	18.3	6.1

Avg. weight from 4 plants 5 weeks after planting.
Yield data collected in a once-over harvest.

Muskmelon:

Row covers have a dramatic effect on early plant growth of muskmelons. The length of the longest vine at the last cover removal data (E5 or L5) was increased by the covers (Table 3). This is important since early yield has been shown to be related to early plant growth.

Row covers improved early yield and had a slight effect on total yield of melons (Table 3). The increase in total yield was due to a longer picking season with the cover treatments, although fruit size suffered later in the season (Table 4).

Leaving the covers on muskmelon plants for 5 weeks increased early and total fruit yield, but reduced average fruit size. To maximize economic yield, covers should be left on long enough to increase the yield of larger melons. A degree day system to predict the optimum removal time might help improve the reliability of row covers.

Table 3. Time of row cover treatment on plant growth and total yield of early and later planted muskmelons.

	Vine growth		Fruit	Avg. fruit per plant	
	Length (in.)	Weight (lbs.)	Wt. (lbs.)	Total (No.)	Early (No.)
E0	10.8	NA	5.2	1.4	0.4
E2	36.0	0.4	4.3	1.3	1.1
E3.5	42.8	0.6	3.9	1.3	1.1
E5	47.7	1.2	3.5	1.8	1.5
L0	37.2	0.4	5.8	1.0	0.7
L2	57.6	1.0	5.2	1.2	0.9
L3.5	64.3	1.4	4.6	1.1	1.0
L5	76.3	1.7	5.0	1.7	1.7

Length of the longest vine 5 weeks after planting.
Average weight of 2 plants 5 weeks after planting.
Based on total yield of 6 harvests from 7/21 - 8/9.
Based on total yield of 3 harvests from 7/21 - 7/29.

Table 4. The effect of time of cover treatment on average fruit weight (lbs.) at successive harvests.

Harvest Number	E0	E2	E3.5	E5	L0	L2	L3.5	L.5
1	--	4.5	3.0	3.0	--	--	5.0	--
2	5.7	4.6	4.4	4.0	--	5.2	4.4	5.1
3	5.7	4.0	6.4	4.9	6.2	5.6	4.9	4.9
4	5.8	--	--	--	5.9	--	4.2	--
5	4.5	3.2	3.9	3.6	5.1	4.8	--	--
6	4.2	4.0	4.0	3.9	4.2	4.1	4.0	--

Summary

In order to optimize plant response to the cover environment, it is important for the grower to make correct management decisions. The length of time in which the tunnel is in place will have a marked effect on plant response. Unfortunately, it is impossible to recommend a fixed number of days for covering, since plants respond to the changing environment rather than the number of days they are covered. Environment under the cover will depend on planting date and unpredictable daily temperatures. Therefore the optimum time for covering will be different each year or at each location.

In Urbana, Illinois in 1986, the optimum covering time was two weeks for tomatoes, three to five weeks for broccoli, and three to five weeks for melons, depending on whether they were planted early or late. If these optimums could be related to a fixed number of degree days (or heat units), perhaps a grower would be able to predict the best cover removal date. This study is part of a national effort to determine those degree day optimums for tomatoes, broccoli, and muskmelon.

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ROW COVER EFFECTS ON BELL PEPPER YIELD AND FRUIT QUALITY

G. Choi, J. M. Gerber, and W. E. Splittstoesser

The use of plastic row tunnels as protective coverings to improve early yield and total production has become increasingly popular for vegetables such as muskmelons and summer squash (1,2,3). Little work, however, has been done on bell peppers. Peppers are one of the most sensitive crops to temperature extremes and perhaps one of the most responsive to temperature management (4,5). While the risk of mismanagement is great, the potential results are also high if covers can be successfully used as a cultural tool to improve yield and quality.

Warm temperatures early during the development of the pepper plant may predispose it to produce more blocky, four lobed fruit, especially at the first harvest. Since flower primordia are differentiated inside the stem 4 to 6 weeks before the flowers actually appear, the temperature at this time is critical to the development of marketable fruit. Row covers may be useful tools to increase temperature after transplanting, and thus, improve fruit shape in the first several pickings.

The objective of this study was to evaluate the effect of the time in which the protective cover is in place on early vegetative growth, flowering and fruit development of bell peppers (Capsicum annum).

Materials and Methods

Location: Vegetable Research Farm, Urbana, IL

Soil type: Drummer silty clay loam

Planted: "Lady Bell" was seeded on March 27, transplanted to field on May 21.

Plot: Each plot was 45 feet long and 5 feet apart, with plants 18" apart in the row (30 plants per plot). All plots were covered with Kimberly Farms Row Covers at planting, which were supported by wire hoops spaced approximately 6 feet apart. There were 4 replications of each of the 7 treatments.

Treatments:
- T1 - cover left on for one week after planting
- T2 - cover left on for two weeks after planting
- T3 - cover left on for three weeks after planting
- T4 - cover left on for four weeks after planting
- T5 - cover left on for five weeks after planting
- T6 - cover left on for six weeks after planting
- T7 - cover left on for seven weeks after planting

Data: At each cover removal date, 10 plants were cut from that treatment. They were weighed and leaf number and branch number were counted.

Harvest: Peppers were picked on 7/27, 8/13, and 8/28. They were divided into red fruit, partially red, and green. They were further separated into one, two, three, and four lobed fruit. Data was collected on fruit weight in each category and 10 fruit were measured for length and width. Width measurement was taken at the stem end of the fruit.

Results and Discussion

Since the covers can produce very high temperatures, there was a concern that plant growth could be reduced by the longer treatment times. However, the pepper plants increased in weight, leaf number and branch number under the tunnels up to seven weeks (Table 1).

Yield at the first harvest date was improved by leaving the covers on up to 5 weeks. Leaving the covers on peppers longer than 5 weeks reduced the number of three and four lobed fruit. The average number of four lobed fruit produced per plant was four times greater under the 5 week cover compared to the 1 week cover treatment (Table 2).

Total yield was also best if the cover was left in place for 5 weeks after planting. The five week cover treatment increased the total number of fruit picked. This increase was noted primarily in the three and four lobed categories. Leaving the covers in place for 7 weeks had a detrimental effect on yield of all lobe categories (Table 3).

Table 1. Average fresh weight (gms.), leaf number, and branch number from 10 plants at each cover removal date.

Treatment	Fresh weight (gms.)	Leaf number	Branch number
T1	59.8	12.4	2.0
T2	154.2	29.4	11.9
T3	402.6	79.3	28.6
T4	718.9	109.9	44.0
T5	1235.7	148.2	63.9
T6	3890.4	185.5	68.3
T7	5827.9	316.8	131.4

Table 2. Average number of fruit per plant in each lobe category picked at the first harvest.

Treatment	One lobe	Two lobe	Three lobe	Four lobe
T1	0.2	0.7	2.9	0.5
T2	0.2	0.7	2.6	0.5
T3	0.3	0.9	3.3	0.9
T4	0.4	0.6	3.3	1.2
T5	0.2	0.7	4.2	2.2
T6	0.3	0.7	3.8	1.2
T7	0.2	0.5	3.3	0.9

Table 3. Average number of fruit per plant in each lobe category for all three harvests.

Treatment	One lobe	Two lobe	Three lobe	Four lobe
T1	1.4	1.5	7.2	2.6
T2	1.2	1.4	5.5	2.2
T3	1.8	1.6	6.4	1.4
T4	1.4	1.4	7.0	3.2
T5	1.1	1.9	10.1	5.6
T6	1.7	1.9	10.4	4.9
T7	0.7	1.1	5.3	2.1

Table 4. Average length/width ratio of 10 fruit in each lobe category from the first harvest.

Treatment	One lobe	Two lobe	Three lobe	Four lobe
T1	1.6	1.3	1.3	1.1
T2	1.6	1.5	1.4	1.2
T3	1.6	1.5	1.4	1.2
T4	1.6	1.4	1.4	1.2
T5	1.4	1.5	1.4	1.1
T6	1.6	1.5	1.3	1.2
T7	1.8	1.6	1.4	1.2
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All	1.6	1.5	1.4	1.2

Table 5. Average fruit weight in each lobe category from the first harvest.

Treatment	One lobe	Two lobe	Three lobe	Four lobe	All
T1	4.2	4.4	4.4	4.2	4.3
T2	4.2	4.1	4.4	4.5	4.3
T3	4.4	4.1	4.3	3.8	4.2
T4	2.8	3.6	4.1	3.7	3.5
T5	3.4	2.8	2.5	3.1	2.9
T6	2.4	3.3	2.9	3.1	2.9
T7	2.9	2.4	2.4	2.9	2.7
	---	---	---	---	
Mean	3.5	3.5	3.6	3.6	

The ratio of the length of the fruit to the width can help describe any changes in shape that might occur. If the fruit was perfectly square (blocky), the length and width would be the same and the length/width ratio would be equal to 1. Pointed fruit are more likely to be longer and narrower than blocky fruit. If the length is more than the width, the ratio will be greater than 1. For example, a fruit that was twice as long as it is wide would have a length/width ratio of 2.

In the first harvest, the length to width ratio ranged from 1.6 for one lobed fruit to 1.2 for four lobed fruit. There was no effect of treatment on the ratio (Table 4). Although lobe number had an effect on fruit shape, as shown by the l/w ratio, there was no effect of lobe number on fruit weight for the early harvest. The one, two, three and four lobed fruit all had about the same weight (3.5-3.6 oz.) when averaged over all treatments (Table 5).

Leaving the covers on longer generally decreased the average fruit weight in the early harvest (Table 5). This may have been caused by the increase in fruit number. Total yield of fruit increased from T1 to T5 and the increase in plant size (Table 1) may not have been enough to compensate for the additional fruit load. Therefore, fruit size in all lobe categories decreased.

Table 6. Average fruit weight in each lobe category for all three harvests.

Treatment	One lobe	Two lobe	Three lobe	Four lobe	All
T1	2.7	3.4	3.5	3.0	3.2
T2	3.0	3.5	3.8	4.2	3.6
T3	2.9	3.6	3.7	4.2	3.6
T4	2.7	2.9	3.5	3.5	3.2
T5	2.4	2.7	2.8	3.0	2.8
T6	2.6	3.0	3.0	3.0	2.9
T7	2.3	2.4	2.4	2.6	2.4
Mean	---	---	---	---	
	2.7	3.0	3.2	3.1	

When data from all three harvests are considered, there was little difference among average fruit weights of the two, three and four lobed fruit. The one lobed fruit was slightly smaller than the others. Longer cover treatments generally decreased the size of fruit, again possibly due to increased yield (Table 6).

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ROW TUNNEL EFFECTS ON GROWTH, YIELD AND QUALITY OF BELL PEPPERS

Illias Mohd-Khir, John M. Gerber and Walter E. Splittstoesser

The benefits of plastic tunnels in increasing early and total yield of various vegetable crops have been well documented (1,2,4,9,10,11). Enhancement of earliness and increased yields of vegetables under row tunnels are attributed to changes in the plant environment. Environmental parameters modified by row tunnels are light, soil and air temperatures, humidity, and air movement. Air temperature is one of the most important factors affecting plant growth and yield. Row tunnels have been shown to increase air temperature under the tunnel, while outside temperatures are relatively lower (3,4,6,7,11).

Bell pepper is one of the vegetable crops that have been found to be responsive to row tunnel culture. Previous research and observations show that growth, yield, and shape of bell pepper are affected by temperature early in the plant's development. Plant foliage is reasonably tolerant of high temperature, but fruit set under tunnels is impaired at temperatures above 30°C (14). In an experiment to study the influence of three cover materials on growth, early fruit set, and yield of bell pepper (5), it was found that the number of fruit set was reduced by the highest tunnel temperatures, and this reduction was reflected in lower first harvest yields. In another study (7), bell peppers grown under a clear plastic row cover was compared to that grown in the open. The air temperature under the row tunnel was higher than that over the uncovered plot, and yield was correspondingly higher in the covered plot.

The length of time the cover or tunnel is left over the pepper plants is another important consideration in row tunnel use. If left on too long, the resulting high temperatures or accumulative heat units under the tunnels may cause abortion of flowers and small fruits. Also, vigorous vegetative growth of the upright pepper plants may result in injuries to the growing points of the plant due to abrasion against the inside of the tunnel material. The decision of when to remove the tunnel may then become critical. For row tunnels to be effective, they must be managed according to the temperature requirement of the crop.

Studies on the effects of changes in air temperature, as influenced by row tunnels, on growth, yield, and quality of bell pepper are thus necessary to provide better understanding and management skills on the use of these row tunnels in pepper production. A study was undertaken with the following objectives: a) to determine the effect of various tunnel materials and their time of removal on air temperature affecting plant growth; b) to compare tunnel treatments for their effects on growth, early and total yields, and quality of bell pepper; and c) to evaluate a heat unit system for predicting optimum tunnel removal time.

Materials and Methods

Location: Vegetable Research Farm, University of Illinois, Urbana, IL

Soil Type: Drummer silty clay loam

Planting: 7-week old bell pepper cv. "Jupiter" transplants were planted in the field on April 23, 1986. The tunnel treatments were applied immediately after planting.

Plot: Each plot consisted of 15 plants spaced 2 feet apart in the row. All plots were mulched with black plastic. The experimental design used was the split-plot with 4 replicates.

Treatments:

Tunnel material

1. clear slitted polyethylene
2. white slitted polyethylene
3. spunbonded polypropylene (Kimberly Farms Row Cover)
4. no cover

Time of tunnel removal

a. 22 days after planting
b. 32 days after planting
c. 52 days after planting

Data:

1. Air temperature and heat units under each tunnel
2. Plant height, plant fresh weight (above ground portions), and number of branches 52 days after planting
3. Early and total yields
4. Percentage of 2-, 3- and 4-lobed fruits

Results and Discussion

During the period from April 23 to June 14, 1986, when mean ambient temperature was 20.6°C to 26.9°C (Table 1). Highest temperatures were recorded under clear slitted polyethylene, the next warmest under spunbonded polypropylene, and followed by the white slitted polyethylene tunnel treatment.

Table 1. Temperature measurements[z] (°C) with various tunnels and tunnel removal time

Tunnel removal Days after planting	Tunnel material	Average high	Average low	Highest reading	Mean
22	Clear slitted PE[y]	33.5	11.2	55	22.4
22	White slitted PE	30.7	10.6	47	20.6
22	Sp.polypropylene	32.8	11.2	50	22.0
22	No cover	26.2	7.4	31	16.8
32	Clear slitted PE	35.9	11.5	55	23.7
32	White slitted PE	32.6	11.0	47	21.8
32	Sp.polypropylene	35.4	11.8	52	23.6
32	No cover	25.3	7.8	31	16.6
52	Clear slitted PE	41.6	12.1	55	26.7
52	White slitted PE	35.4	11.1	47	23.2
52	Sp.polypropylene	39.3	12.1	52	25.7
52	No cover	26.7	10.2	37	18.5

[z]Data collected from April 23 through June 14, 1986
[y]PE = Polyethylene
Heat units calculated under each tunnel material at various tunnel removal time are shown in Table 2.

Table 2. Heat unit measurements[z] with various tunnel materials and tunnel removal time

Tunnel removal Days after planting	Tunnel materials	Total Heat Units[y]	Heat Units per day
22	Clear slitted PE[x]	331	15.0
22	White slitted PE	248	11.3
22	Sp.polypropylene	291	13.2
22	No cover	149	6.8
32	Clear slitted PE	456	14.3
32	White slitted PE	364	11.4
32	Sp.polypropylene	427	13.3
32	No cover	209	6.5
52	Clear slitted PE	808	15.5
52	White slitted PE	637	12.3
52	Sp.polypropylene	729	14.0
52	No cover	407	7.8

[z]Data collected from April 23 through June 14, 1986
[y]Heat units were calculated as follows:

$$\text{H.U.} = \frac{\text{Daily high} + \text{Daily low}}{2} - 10°C$$

[x]PE = Polyethylene

Highest total heat units were recorded under clear slitted polyethylene. Next highest were under spunbonded polypropylene followed by white slitted polyethylene. The control had the lowest reading.

As a result of high air temperatures and the accumulated heat units under the tunnels, growth of pepper plants was profoundly enhanced. After 52 days growth under the tunnels, plant height, plant fresh weight and number of branches were significantly higher than those of the control (Table 3).

Table 3. Effect of tunnels on plant height, plant fresh weight, and number of branches 52 days after planting

Tunnel material	Plant height (cm)	Plant fresh weight (g)	Number of branches per plant
Clear slitted PE[z]	31.16*a	183.78a	44.62a
White slitted PE	29.11 b	162.09b	38.11b
Sp.polypropylene	31.97 a	215.10a	49.69a
No cover	22.72 c	78.60c	22.08c

[z]PE = Polyethylene
*Values in a column followed by the same letter do not differ significantly at P = 0.05

The tallest plants were found under spunbonded polypropylene and clear slitted polyethylene tunnels while white slitted polyethylene produced shorter plants. The uncovered plants were much shorter. Fresh weight and number of branches per plant of tunnel treated plants were also significantly higher than the uncovered plants. Tunnel treated plants were two to nearly three times greater in fresh weight than plants grown in the open. Time of tunnel removal did not affect plant height and number of branches, but it did affect plant fresh weight (Table 4). Leaving the tunnels on longer increased plant fresh weight, indicating that plants under the tunnels developed stockier and healthier growth, with larger stems, branches and leaves.

Table 4. Effect of tunnel removal time on plant height, fresh weight and number of branches 52 days after planting

Tunnel removal Days after planting	Plant height (cm)	Plant fresh weight (g)	Number of branches per plant
22	31.49*a	162.51b	42.45a
32	32.19 a	179.94b	47.48a
52	28.56 a	218.53a	42.49a
No cover	22.72 b	78.60c	22.08b

*Values in a column followed by the same letter do not differ significantly at P = 0.05

Enhanced vegetative growth of plants under tunnels subsequently resulted in high early yields. Bell pepper yields under clear slitted polyethylene and spunbonded polypropylene tunnels were more than double over the control (Table 5). White slitted polyethylene produced the lowest early yield among the tunnel treatments.

Table 5. Effect of tunnels on early yield of bell pepper

Tunnel material	Early yield[z] (lb. per acre)
Clear slitted PE[y]	6219.93*a
White slitted PE	4947.67 b
Sp. polypropylene	6346.20 a
No cover	2857.70 c

[z]Data based on first two harvests
[y]PE = Polyethylene
*Values in a column followed by the same letter do not differ significantly at P = 0.05

The effects of tunnels and their time of removal on total yield of bell pepper are shown in Table 6. Pepper plants under spunbonded polypropylene for 52 days gave the highest yield, while the lowest under tunnels was recorded from plants under clear slitted polyethylene for 52 days. Uncovered plants gave the lowest yield. The general trend observed was that the longer the tunnel was placed over the plants, the higher the yield. With clear slitted polyethylene, however, yield was reduced when the tunnel was left on for 52 days after planting.

Table 6. Effects of tunnels and tunnel removal time on total yield of bell pepper (after four harvests)

Tunnel removal Days after planting	Tunnel material	Total yield (lb. per acre)
22	Clear slitted PE[z]	9,171.96*bc
22	White slitted PE	7,425.27 c
22	Sp. polypropylene	9,094.87 bc
22	No cover	5,009.10 d
32	Clear slitted PE	10,179.78 b
32	White slitted PE	8,825.76 bc
32	Sp. polypropylene	9,695.41 b
32	No cover	5,009.10 d
52	Clear slitted PE	8,329.27 c
52	White slitted PE	10,173.92 b
52	Sp. polypropylene	13,563.17 a
52	No cover	5,009.10 d

[z]PE = Polyethylene
*Values in a column followed by the same letter do not differ significantly at P = 0.05

Tunnels also affected the lobe number of bell pepper fruits. A 4-lobed fruit tends to be blockier and less pointed than 3- or 2-lobed fruits and this is an improvement in fruit quality. The effect of tunnels on the production of 2-, 3- and 4-lobed fruits is shown in Table 7. A large percentage of 2-lobed fruits was produced from plants grown in the open. There were no differences among the tunnels in the production of 3-lobed fruits, but it was higher than that of the control. Clear slitted polyethylene and spunbonded polypropylene produced a high percentage of 4-lobed fruits than white slitted polyethylene, while there was very low percentage of 4-lobed fruit from the uncovered plants. It is interesting to note that tunnels nearly eliminated 2-lobed fruits.

Table 7. Effect of tunnels on the percentage (by numbers) of 2-, 3- and 4-lobed fruits after four harvests

	Fruit type (%)		
Tunnel material	2-lobed	3-lobed	4-lobed
Clear slitted PE[z]	4.28*b	54.13a	41.53a
White slitted PE	7.80 a	56.19a	35.98b
Sp. polypropylene	3.88 b	51.47a	44.65a
No cover	36.22 c	44.46b	18.18c

[z]PE = Polyethylene
*Values in a column followed by the same letter do not differ significantly at P = 0.05

The results point to the benefits of increased air temperatures under the tunnels. High tunnel temperatures resulted in vigorous vegetative growth of the pepper plants under the tunnels and early and total yields were subsequently higher. Tunnel removal time also affects growth and yield. It is important that tunnels be removed at the appropriate time so as not to injure the plant, affect its growth and fruit set, and finally, yield. However, there is no specific recommendation as to when to remove a particular tunnel over a crop under a certain environmental condition. This is because the length of time a tunnel should be placed over the crop depends on the prevailing environmental conditions, particularly that of air temperature.

One of the purposes of this study was to evaluate a heat unit system for predicting tunnel removal time. From this study we found that heat units of 729 gave maximum yield and heat units of 808 decreased yield. This may suggest that tunnels over pepper should be removed when the calculated heat units under the tunnels have reached values of around 700. If left on longer, further accumulation of heat units under the tunnel may reduce yield.

It is not possible to make recommendations as to which tunnel material is best for pepper and for how long the tunnel should be left over the crop. No one cover is best for all crops under all environmental conditions. The decision of when to remove the cover or tunnel can be made only through close monitoring of air temperatures under the tunnels.

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THE EFFECT OF HOT CAPS AND ROW COVERS ON CUCUMBER AND MUSKMELON PRODUCTION

Robert E. Call

Growers and researchers are continually searching for means of improving crop performance that result in increased early and total yields. Greater earlier and total yields usually mean greater financial returns.

New materials for making hot caps and row covers have caused renewed interest in use by commercial growers. Hot caps and row covers protect seedlings and young plants from adverse weather. They improve the microenvironment around the plants which enhances growth and development.

This study tested the yield response of cucumbers (Cucumis sativus), and muskmelon (Cucumis melo), using two new products: Protecta-Cap, a corrugated plastic hot cap, and Kimberly Farms Row Cover, a 0.6 oz/sq. yard spunbonded polypropylene fabric. Liberty Diversified Industries and Kimberly-Clark helped fund this study. This study was conducted at the Dixon Springs Agricultural Center.

Materials and Methods

On April 15, 1986 cucumber cv. 'Slice Nice' and muskmelon cv. 'Gold Star' were hand planted into Grantsburg silt-loam soil, 2-3 seeds per hill. Spacing was two feet between hills, and ten feet between rows. Treatments were: hot cap, row cover, and bare soil as a check. A completely randomized block design was used with five hills per plot, replicated four times. All plots were fertilized in accordance to the Illinois Extension Circular 1185, "Fertilizer Guide for Commercial Vegetable Growers." Alanap and Prefar herbicides were applied preplant for weed control. Treatments were applied the day after seeding and plants were thinned to one per hill after emergence. Plots were irrigated with 1.0 to 1.5 inches of water each week of no rain fall. May 14-18, 7.92 inches of rain fell.

Soil, maximum/minimum, and current ambient temperatures were recorded daily for each treatment and crop beginning May 1 (Table 1). Soil thermometers were placed one inch deep in the soil. Ambient temperatures were converted into growing degree hours per day (gdH/d), (Lorenz, 1980), 60 degrees being the base temperature. The following formula was used:

$$[(\text{Maximum} + \text{minimum daily temperature})/2] - 60 = \text{gdH/d}$$

Hot caps were vented when temperatures inside reached 105 to 110 degrees F. The hot caps and row covers were removed after the plants began to vine and before female blossoms required pollination by bees. Row covers were removed from the cucumbers on May 29 and on June 6 from the muskmelons. Hot caps were removed from the cucumbers on June 6 and from the muskmelons on June 13.

Early harvest for cucumbers was June 23 through July 14; total harvest was completed August 6, 1986. Early harvest for the muskmelons was July 21 through July 28; total harvest was completed August 25, 1986.

Results and Discussion

Emergence of all plants occurred within three days of each other, between May 9 and May 12, except for the muskmelons covered with hot caps. The check recorded the highest average soil temperature, followed by the row cover and hot cap, followed by the check. Twenty-four hour recording soil thermometers were not used. Over a 24 hour period the mean soil temperature under the hot caps and row covers were expected to be greater than the check.

Muskmelons covered with hot caps did not completely emerge until May 28, two weeks after the other treatments. The optimum soil temperature range for germination of cucumbers is 60-95 degrees F, and 75-95 degrees F for muskmelons (Lorenz; 1980). If soil temperature is constantly maintained at 86 degrees F, germination will occur in three to four days for both crops (Harrington; 1954). The hot caps are made of a white plastic that reflects radiant sunlight. The soil under the hot caps was the coolest of all treatments (Table 1). This caused the muskmelons to germinate slower than the cucumbers which will germinate and grow under lower temperatures. The row cover, also white, is porous and probably reflects some radiant energy. Soil temperatures under the row cover also averaged slightly cooler when compared to the control. However, air temperatures were higher under the row cover and the hot cap (Table 1). Average gdH/d accumulation were 9.7 and 8.0 greater for the row covers and hot caps respectively, when compared to the control (see Table 1).

Seeds of only one of four replications of the muskmelon checks emerged. Rodents dug up and ate the seeds from three replications. This didn't occur with the hot caps or row covers because the rodents could not get to the seeds. Early and total yield were greatest with row covers, followed by the hot caps when compared to the check for cucumbers, Table 2, and for muskmelons, Table 3. Plants under the row covers produced the largest sized fruit.

Perhaps clear hot caps would increase soil temperatures, thus faster germination for the muskmelons or other crops with higher soil temperature requirements for germination. To ensure faster germination, the white hot caps could be placed over the plants after emergence and thinning. Hot caps and row covers placed on and over black plastic mulch could also increase soil temperatures for faster germination.

Literature Cited

Harrington, J. F., and P. A. Minges. 1954. Vegetable Seed Germination. p. 5. California Agricultural Extension Mimeo Leaflet. Davis, CA

Lorenz, O, A, and D. N. Maynard. 1980. Knott's Handbook For Vegetable Growers. pp. 51, 58. John Wiley and Sons, Inc. New York, NY

Table 1. Soil and Air Temperatures in Degrees Fahrenheit for May

Date	Row cover		Hot caps		Check	
	Soil Temperature	gdH/d	Soil Temperature	gdH/d	Soil Temperature	gdH/d
	(°F)		(°F)		(°F)	
5/01	80		73		75	
2	80		72		79	
3	71		64		70	
4	74		70		71	
5	60		60		65	
6	66		66		74	
7	82	31.0	75	28.0	88	20.5
8	82	23.0	80	32.0	95	33.0
9	84	42.5	80	38.0	93	31.0
10	79	40.0	76	33.0	82	25.5
11	75	34.5	72	35.0	74	18.0
12	79	32.0	75	22.5	80	16.5
13	78	30.5	75	27.0	83	17.0
14	79	29.0	75	20.5	84	17.5
15	76 Avg.	31.0	72 Avg.	27.0	80 Avg.	17.5
16		23.5		22.0		13.0
17		21.5		25.0		15.0
18		15.5		19.5		9.5
19		16.0		10.5		- 1.5
20		14.5		11.5		1.0
21		22.0		13.5		2.5
22		16.5		14.5		6.0
23		15.5		18.0		10.0
24		24.0		25.0		16.5
25		23.5		25.5		14.5
26		25.0		23.0		15.0
27		24.5		23.5		15.0
28		25.0		30.5		21.0
29		31.0		28.5 Hot cap vented		23.0
30		23.5		22.0 Hot cap vented		21.0
31		27.5		25.0 Hot cap vented		22.5
Average		25.7		24.0		16.0
Standard deviation		7.34		7.02		8.37

Table 2. Effect of Hot Caps and Row Covers on Yield of "Slice Nice" Cucumbers

Treatment	Early Yield[1]				Total Yield[2]					
	U. S. No. 1	Wt.	Market-able	Wt.	U. S. No. 1	Wt.	Market-able	Wt.	Avg. size	Culls
	(no)	(lb)	(no)	(lb)	(no)	(lb)	(no)	(lb)	(oz)	(no)
Hot Cap	7.6	4.1	19.1	8.1	17.7	10.6	36.6	18.4	7.9	7.4
Row Cover	10.9	6.0	20.6	9.6	23.1	13.9	41.4	21.6	8.4	7.6
Check	7.4	3.9	16.0	6.9	17.7	10.6	33.2	16.7	8.2	8.3

All data on a per plant basis.

[1]Early yield - 6/23/86 - 7/14/86
[2]Total yield - 6/23/86 - 8/06/86

Table 3. Effect of Hot Caps and Row Covers on Yield of "Gold Star" Muskmelons

Treatment	Early Yield[1]			Total Yield[2]		
	Yield	Total weight	Avg wt /fruit	Yield	Total weight	Avg wt /fruit
	(no)	(lb)	(lb)	(no)	(lb)	(lb)
Hot Cap	0.1	0.5	4.8	3.0	12.5	4.2
Row Cover	2.0	8.9	4.4	5.8	26.2	4.5
Check[3]	2.0	10.3	5.2	4.0	19.4	4.9

All data on a per plant basis.

[1]Early yield - 7/21/86 - 7/28/86
[2]Total yield - 7/21/86 - 8/25/86
[3]In three of four plots, seeds were eaten by rodents.

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PROCESSING CUCUMBER CULTIVAR EVALUATION AT VARYING NITROGEN REGIMES

Randall K. Lindstrom and John M. Swiader

Processing vegetable crops are becoming an important alternative to many vegetable growers and increasing numbers of grain farmers. One such crop is machine harvested cucumbers for processing. Four cultivars were tested at four levels of nitrogen fertility.

Materials and Methods

Cultivars: Four listed in Table 1.

Planting: Direct seeded with tool bar mounted Planet Jr. seeder on May 28

Treatments: 40 lbs N plowdown, 40 lbs N sidedressed at tipover
80 lbs N plowdown
80 lbs N plowdown, 40 lbs N sidedressed at tipover
120 lbs N plowdown

Plots: Each fertility level, 50' long by 27.5' wide, was replicated four times. Within each fertility level block, three 18" rows (guard rows on either side of data row) of each of the four cultivars was planted. Plants were thinned to approximately 4" apart.

Soil: Watseka Fine Sandy Loam

Fertilization: 150 lbs/A K_2O plowdown
50 lbs/A P_2O_5 plowdown

Weed Control: 4 lbs a.i.a. Prefar PPI
3 lbs a.i.a. Alanap PPI

Irrigation: As needed with solid set impact sprinkler

Insect Control: 20 oz. of 15G Furidan per 1000' of row
.2 lbs a.i.a. Pydrin as needed

Disease Control: Ridomil 2E
2-1/4 pts/A Bravo 500
2.0 lbs/A Kocide 101
2.0 lbs/A Mancozeb

Harvest: July 11, 13, 14. Once over pick

Data: Data taken from center 25' of data row

Table 1. Harvest Data for Cucumber Cultivar Fertility Study

Variety	Source	Treatment	Harvest Date	Plants per 25' row	Fruit per 25' row	Frt. per plant	Weight of frt. 25' row	No. Fruit in Grade						Avg. 3F Frt. Length (in.)
								1	2	3E	3F	CN[1]	OS[2]	
Flurry	A	80/40	7/13	44	53	1.24	13.25	5	12	17	14	4	3	5.01
		120	7/13	39	38	1.00	8.36	2	12	6	8	3	2	5.04
		40/40	7/13	41	40	.99	10.23	4	9	10	10	4	3	5.00
		80	7/13	44	54	1.24	9.22	3	14	14	15	20	3	5.20
Gynomite	A	80/40	7/14	49	47	.89	10.50	5	13	17	9	0	2	4.63
		120	7/14	64	49	.78	8.98	11	15	12	7	3	2	4.80
		40/40	7/15	46	39	.85	12.25	1	6	10	16	1	5	4.61
		80	7/14	39	41	1.10	9.38	6	12	10	8	1	5	4.87
Calypso	AR	80/40	7/14	77	77	1.03	19.44	10	12	20	21	6	10	4.90
		120	7/13	53	53	.99	17.85	6	13	15	12	5	2	4.92
		40/40	7/14	58	54	.91	12.31	8	12	16	13	2	3	4.87
		80	7/14	55	54	1.00	33.13	6	8	11	11	10	8	4.86
H3534	HZ	80/40	7/11	49	46	.94	4.30	0	18	20	7	0	1	4.88
		120	7/11	47	46	.98	5.10	2	17	21	7	0	1	4.75
		40/40	7/13	50	52	1.00	12.38	2	2	9	11	20	8	4.78
		80	7/13	53	39	.76	18.28	2	2	3	7	12	14	4.89

[1]Crooks and Nubs
[2]Oversize

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PROCESSING TOMATO TRANSPLANT CULTIVAR EVALUATION UNDER HIGH N REGIME

Randall K. Lindstrom and John M. Swiader

As a general rule in nitrogen fertilization for machine harvested tomatoes, only sufficient N should be available to meet early plant growth requirements and fruit development, plus maintain plant vigor. The nitrogen levels in the plant should generally decline, especially at the later growth stages.

Excessive nitrogen can delay maturity, cause surplus vine growth, make plants more susceptible to disease and drought, and frequently reduce yields. This problem is compounded on sandy soils where high rates and sidedressings of nitrogen are often used to compensate for N leaching and low levels of organic matter.

This study will evaluate transplanted processing tomato cultivars on a sandy soil grown with high nitrogen.

Materials and Methods

Location: Kankakee River Valley Research Field, Witchert, IL

Cultivars: Fifteen listed in Tables 1 and 2.

Planting: Seeded on April 17, transplanted in field on May 22.

Treatments: 75 lbs/A N plowdown
150 lbs/A N plowdown

Plot: Plots 25' long with 25 plants spaced 12" apart in the row and 5' between rows; 3 replications.

Soil: Maumee Loamy Fine Sand

Fertilization: 150 lbs/A K_2O plowdown
50 lbs/A P_2O_5 plowdown

Growth Regulator: Ethrel applied at 3-1/4 pints/A when individual cultivar showed 25% red or turning.

Weed Control: .5 lb a.i.a. trifluralin (Treflan) PPI

Irrigation: as needed with solid set impact sprinklers.

Insect Control: 0.2 lb a.i.a. fenvolevate (Pydrin)

Disease Control: 3 lbs (material) per acre Mancozeb
2 lbs (material) per acre Kocide 101
2 lbs (material) per acre Benlate

Harvest: August 8 through August 21

Data: Data was collected from the middle 15' of row.

Results and Discussion

Cultivars are arranged in Tables 1 and 2 from highest to lowest total yields (red/pink & green) in response to the respective nitrogen rate.

There were no significant yield differences between nitrogen rates for H-1810, H-7135, H-7155, HM 3075, XPH 5210, and XPH 5212. Slight increases in yield at the high nitrogen rate were exhibited by Advantage, H-7145, and H-7190. The cultivar, H-1784, showed a large increase in yield. Conversely, Dorado, H-6004, MOX 3089 and XPH 5211 showed a slight decrease in yields at the higher nitrogen levels. Only in one case, Hyb 898, was there a significant yield reduction at the high nitrogen rate.

As expected, most cultivars had an increase in vine cover with the higher nitrogen rate. Five cultivars; H-7190, H-6004, XPH 5210, XPH 5211, and Hyb 898, showed better disease tolerance at the higher nitrogen level while one cultivar, H-1810 showed an increase in disease pressure at the 150 lb/A nitrogen rate.

Several cultivars, H-1784, XPH 5210, and Hyb 898 showed an increase in culls at the higher nitrogen rate. The majority of the cultivars tended to show a reduction in the percentage of culls at the 150 lb/A nitrogen rate. In particular, H-1784 and H-7190 exhibited a higher percentage of cull fruit regardless of nitrogen rate.

In general, higher nitrogen rates did not appear to enhance or delay fruit maturation and the resulting harvest date.

At the high nitrogen rate, H-7155, H-7190, XPH 5212, Advantage, MOX 3089 and H-6004 yielded a higher percentage of Red/Pink fruit. Decreases in the percent yield of Red/Pink fruit occurred with Dorado, H-1784, H-1810, H-7135, XPH 5210, XPH 5211, and Hyb 898 at the 150 lb/A nitrogen rate. There appeared to be no significant yield difference for Red/Pink fruit for H-7145, and HM 3075 at the high nitrogen rate. H-1784, H-7135, H-6004, HM 3075, XPH 5210 and XPH 5211 had higher than the average percent green fruit no matter what the nitrogen rate.

H-7155, Dorado, H-7145, and XPH 5212 were among the better cultivars evaluated in this study.

This study revealed that individual processing tomato cultivars have varying responses to high nitrogen rates. In general, for most situations, 70 to 90 lbs of nitrogen per acre will be sufficient for transplanted tomatoes grown for machine harvest.

Table 1. Processing Tomato Harvest Data at the Low Nitrogen Level (75 lbs N/A)

Variety	Source	Shape[1]	Harvest Date	Yield T/A			% Culls	Avg. Fruit Wt(oz.)	Stem scar dia(mm)	Core length (mm)	Disease Rate[2]	Vine Cover[3]
				Red/Pink	Green	Total						
H-7155	HZ	E	8/20	37.1	5.3	43.4	2.3	4.1	11	12	2.0	1.5
Dorado	HM	EP	8/21	35.5	4.8	41.5	2.8	2.8	7	17	2.0	3.5
H-1810	HZ	E	8/8	30.8	3.2	34.6	1.7	2.7	10	20	3.0	4.0
H-6004	HZ	E	8/12	16.1	15.2	32.5	3.8	3.0	11	17	2.5	3.0
MDX 3089	HM	E	8/4	26.4	4.1	32.1	4.9	2.3	7	21	4.0	4.0
Hyb 898	A	SR	8/19	26.2	3.9	31.1	3.1	2.8	10	14	2.5	3.5
XPH 5212	A	R	8/18	15.5	13.1	30.9	7.3	3.7	13	7	3.0	3.5
H-7135	HZ	R	8/20	25.8	4.1	30.9	3.3	3.1	11	17	2.0	3.0
H-7145	HZ	ER	8/18	26.3	2.8	30.5	4.7	2.8	9	17	2.5	3.5
H-7190	HZ	E	8/6	19.9	7.6	29.9	8.1	2.7	8	14	4.0	3.5
XPH 5211	A	E	8/19	20.4	6.9	28.3	3.6	3.8	12	14	2.5	3.0
H-1784	HZ	E	8/13	12.6	13.3	28.3	8.3	3.0	12	5	2.0	3.0
XPH 5210	A	SR	8/19	22.3	3.7	28.2	7.9	2.9	8	8	2.5	3.0
HM 3075	HM	E	8/9	19.5	7.3	28.0	4.3	2.2	7	22	3.5	4.0
Advantage	HM	E	8/12	13.9	12.5	27.5	3.9	3.1	8	23	3.5	3.5

[1]Shape: "E" elongated, "R" round, "S" small, "P" pear
[2]A subjective visual rating; 1 no disease; 5 high disease incidence
[3]A subjective visual rating; 1 vigorous vine growth; 5 sparse vine growth

Table 2. Processing Tomato Harvest Data at High Nitrogen Level (150 lbs N/A)

Variety	Source	Shape[1]	Harvest Date	Yield T/A			% Culls	Avg. Fruit Wt(oz.)	Stem scar dia(mm)	Core length (mm)	Disease Rating[2]	Vine Cover[3]
				Red/Pink	Green	Total						
H 7155	HZ	E	8/20	38.3	3.8	42.8	1.7	3.4	8	15	2.0	1.0
Dorado	HM	EP	8/21	32.0	6.1	38.9	1.9	2.5	6	17	2.0	3.0
H 1784	HZ	E	8/13	15.3	17.3	34.3	4.8	2.8	12	10	2.0	2.0
H 1810	HZ	E	8/8	28.7	4.5	34.2	2.8	2.9	8	20	4.0	3.5
H 7145	HZ	ER	8/18	28.1	4.1	33.3	3.1	2.7	13	8	2.5	3.0
H 7190	HZ	E	8/6	26.6	3.7	32.3	6.2	2.4	7	12	3.5	3.5
XPH 5212	A	R	8/18	28.4	2.5	31.7	2.6	3.1	14	8	3.0	3.5
H 7135	HZ	R	8/20	22.5	8.2	31.7	2.9	2.9	11	14	2.0	2.0
Advantage	HM	E	8/12	26.2	3.3	30.5	3.3	2.5	6	24	3.5	3.0
MOX 3089	HM	ER	8/4	24.9	3.4	29.3	3.5	2.1	12	14	4.0	4.0
H 6004	HZ	E	8/12	20.2	8.2	29.1	2.1	2.9	10	5	2.0	2.5
HM 3075	HM	E	8/9	19.9	7.2	28.1	3.8	2.0	6	12	3.5	4.0
XPH 5210	A	SR	8/19	19.3	7.8	27.8	2.5	2.5	10	3	2.0	2.5
XPH 5211	A	E	8/19	12.0	11.8	24.4	2.4	3.2	12	11	2.0	2.0
Hyb 898	A	SR	8/19	15.1	5.5	21.3	3.5	2.4	9	4	2.0	3.0

[1]Shape: "E" elongated, "R" round, "S" small, "P" pear
[2]A subjective visual rating; 1 no disease, 5 high disease incidence
[3]A subjective visual rating; 1 vigorous vine growth, 5 sparse vine growth

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ASPARAGUS CULTIVAR OBSERVATION

Carl J. Cantaluppi

Recently, there is great interest in commercial asparagus production, due to the new hybrid cultivars developed with a predominance of male versus female plants. Asparagus is normally dioecious (male and female plants). Females produce seeds. The male plants yield more than the females and have larger spears. The female plants expend energy to produce seeds which results in a lower spear yield than male plants. Also, seeds from female plants fall to the ground, germinate, and become seedling weeds in a commercial field.

This study was done in order to see what kinds of yields can be expected in Northern Illinois using the new hybrid cultivars as compared with the standard Mary Washington cultivar. Research has shown that harvesting spears one year after planting stimulates production of more buds (spears) on the crown (root system), causing greater yields in future years.

Materials and Methods

Location:	Rock Island County Extension Office, East Moline
Soil type:	Raddle Silt loam
Planted:	June 21, 1985. One year old crowns planted 6" deep.
Plot size:	2,750 sq. ft. consisting of 9-50 foot rows, each row containing one variety with a single replication
Spacing:	5 feet between rows, 1 foot between plants in the row. (8,712 crowns/acre)
Fertilization:	Preplant broadcast, disced in: 60#/A N 200#/A P_2O_5 200#/A K_2O
Irrigation:	None
Insect Control:	Sevin 1.5 lbs a.i.a. Malathion 1.0 lb a.i.a.
Weed Control:	Hand weeded
Harvest:	April 7, 9, 15, and 19 when spears were 7" to 9" tall. Harvest ended when spears were less than 3/8" in diameter

Results and Discussion

Yield data is found in Table 1.

The UC 157 cultivar produced the highest yield. However, I am hesitant to recommend it to growers because Dr. Hugh Price's data from Michigan State University shows UC 157 decreasing in yield after the third to fourth year. I believe this is due to UC 157 being a California-bred cultivar that thrives only in warmer climates. I will have to wait a few years to see what happens in Illinois.

The New Jersey Hybrids (Syn 4-56 and Syn 4-51) seem to display more regional adaptation than the California hybrids, and they also show good tolerance to fusarium crown and root rot, which can cause a gradual dying out of asparagus fields.

Franklin, Blockland, and Limbras 18 are cultivars from the Netherlands which exhibit lower yields than the New Jersey Hybrids. They are also susceptible to asparagus rust, a fungus disease that can cause fern dieback.

Cultivars I am recommending for 1987 planting are Syn 4-56, Syn 4-51, and Jersey Centennial, in that order. Yields from the eight growers who planted the Syn 4-51 cultivar in the spring of 1985 and harvested for the first time in the spring of 1986 amounted to an average of 500 pounds per acre per grower. The data are excellent, and I hope to see yields double next year.

Table 1. Asparagus Cultivar Observation Harvest Data

Cultivar	Source	Total yield lb/A	Yield (lb/) >3/8" dia.	Yield (lb/) <3/8" dia.	%>3/8" dia. by wt.	# of spears harvested per plant
UC 157 (F1)	OK	610	545	65	89	3
Syn 4-56 (OK)[a]	OK	555	490	65	88	3
Syn 4-56 (MI)[b]	MS	544	479	65	90	4
Syn 4-51	MS	496	414	82	84	3
Viking KB3	MS	348	261	87	75	3
Franklin	MS	348	261	87	84	3
Blockland	MS	294	261	33	89	2
Limbras 18	MS	207	174	33	73	2
Mary Washington	--	152	70	82	49	2

[a]Crowns grown in Oklahoma
[b]Crowns grown in Michigan

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PROCESSING CUCUMBER VARIETY TRIAL

Ruth A. Bernard and Carol Robertson

Processing vegetable crops are becoming an important alternative to many vegetable growers and increasing numbers of grain farmers. One such crop is machine harvested cucumbers for processing. Four processing cucumber cultivars were compared in Mason County.

Materials and Methods

Location: Pheiffer's farm, Havana, Illinois

Cultivars: H3534, Flurry, Gynomite and Calypso.

Planting: Direct seeded with Planet Jr. seeder on May 29, June 9 and June 23.

Plots: Rows were 50 feet in length with 30 inches between the rows and 4 replicates per cultivar. Plants were thinned to approximately 4 inches between plants.

Soil: sandy loam, 1.5-2.0% organic matter

Fertilization: 150 lb/A K_2O plowdown
80 lb of N/A anhydrous ammonia preplant
100 lb/A, 10-34-0 starter fertilizer preplant
10 lb of N/A, 28-0-0 in irrigation water

Weed Control: 4 lbs aia Prefar PPI
3 lbs aia Alanap PPI

Insect Control: 20 oz. of 15G Furidan per 1000' of row
.2 lbs aia Pydrin as needed
1 lb aia Sevin as needed

Disease Control: 2.0 lbs/A Kocide 101
2.25 pts/A Bravo 500

Harvest: Once over pick.

Data: Data taken from center 25 feet of row.

Table 1. Harvest Date for Cucumber Cultivar Study

Variety	Source	Planting Date	Harvest Date	Plants per 25' row	Fruit per 25' row	Fruit per plant	1	2	3E	3F	CN[1]	OS[2]	Avg. 3F Frt. Length (in.)
Flurry	A	4-29	6-20	46	60	1.30	15	18	8	11	3	5	
				48	59	1.23	9	14	12	10	4	10	
				49	54	1.10	8	14	8	10	5	9	
				52	93	1.79	33	19	13	12	7	9	5.01
		5-9	6-26	60	124	2.06	39	17	18	24	13	13	
				69	112	1.62	29	20	17	28	15	3	
				68	63	0.93	9	6	10	20	13	5	
				68	97	1.43	26	14	12	29	13	3	5.38
		5-23	7-8	74	75	1.01	15	12	9	15	13	11	
				72	83	1.15	18	11	12	13	11	18	
				90	83	0.92	15	10	11	13	12	22	
				89	100	1.12	26	13	14	11	12	24	4.78
Gynomite	A	4-29	6-21	49	68	1.39	10	13	6	13	1	25	
				50	62	1.24	11	12	8	16	2	13	
				65	83	1.27	18	17	9	20	9	10	
				47	74	1.57	10	14	6	23	2	19	5.24
		5-9	6-26	88	107	1.22	24	12	23	27	12	9	
				92	120	1.30	30	15	20	26	23	6	
				85	112	1.32	38	18	17	20	16	3	
				57	76	1.33	14	16	12	15	15	4	5.16
		5-23	7-7	70	140	2.00	28	16	22	33	12	29	
				67	103	1.54	36	19	0	20	0	28	
				71	87	1.22	30	12	9	21	9	6	
				73	88	1.20	14	12	18	20	13	11	4.74

Table 1. Harvest Date for Cucumber Cultivar Study (continued)

Variety	Source	Planting Date	Harvest Date	Plants per 25' row	Fruit per 25' row	Fruit per plant	1	2	3E	3F	CN[1]	OS[2]	Avg. 3F Frt. Length (in.)
Calypso	AR	4-29	6-20	55	61	1.11	12	18	6	11	3	11	
				46	50	1.09	14	15	5	7	1	8	
				50	64	1.28	13	18	6	14	6	7	
				58	79	1.36	18	20	12	11	7	11	5.03
		5-9	6-26	86	37	0.43	8	5	6	6	9	3	
				95	109	1.15	25	13	18	27	23	3	
				66	80	1.21	22	12	10	17	16	3	
				74	90	1.22	20	12	16	18	19	5	5.21
		5-23	7-8	85	82	0.96	21	12	12	16	10	11	
				83	84	1.01	19	21	11	16	11	6	
				101	92	0.91	20	26	19	9	17	1	
				94	78	0.83	28	28	8	1	12	1	4.78
Hd534	HZ	4-29	6-19	56	74	1.32	28	9	17	15	2	3	
				45	73	1.62	4	8	23	24	0	14	
				47	57	1.21	8	12	11	15	3	8	
				52	87	1.67	5	14	28	30	1	9	5.25
		5-9	6-25	63	81	1.28	2	12	29	29	2	7	
				65	77	1.18	3	8	14	19	22	11	
				78	83	1.06	3	16	16	33	11	4	
				67	56	0.84	0	8	20	15	7	6	5.12
		5-23	7-6	89	68	0.76	30	17	8	2	9	1	
				78	80	1.03	19	13	9	5	14	19	
				91	58	0.64	4	9	16	7	7	10	
				89	46	0.52	16	10	6	3	6	5	4.72

[1]Crooks and Nubs
[2]Oversize

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EARLY YELLOW SWEET CORN CULTIVAR PERFORMANCE EVALUATION

William H. Shoemaker

Consumers are eager to purchase the first picking of sweet corn and will often pay much more for that product fresh from the farm stand than they would later when supply is good. Growers are therefore interested in finding a cultivar which germinates well in cool, moist soils, matures early and yet has the quality needed to satisfy the consumer. This study compares many of the early yellow sweet corn cultivars in Northern Illinois growing conditions.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL.

Soil Type: Drummer Silty Clay Loam

Plot Layout: One 30' row, rows 36", population 17,500, 3 reps, guard rows.

Planting: Direct-seeded w/jab planter 5/8" deep on 4/24.

Fertility: Applied N, P, K preplant, disced-in, at following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0.
P at 90 lb P04/A as 18-46-0.
K at 125 lb K20/A as 0-0-62.

Sidedressing of N at 25 lb/A at 6 weeks.

Weed Control: Applied a Aatrex/Sutan tank-mix ppi, disced in at following rates:

Aatrex Nine-0 at 3.0 lb aia
Sutan+ 6.7E at 3.0 lb aia

Cultivation as needed

Insect Control: Applied Lorsban 4E preplant tank-mixed with herbicide at 1.0 lb aia.

A maintenance spray program for earworm control was initiated at first sign of silking. This included the following sprays every 3 days:

Pydrin at 1.5 oz aia or
Sevin at 1.5 lb aia plus Lannate at 0.45 lb aia, tank-mixed.

All earworm sprays were applied at high pressure using a high-boy with directed-nozzle drops.

Disease Control: Maintenance sprays of Bravo 500 at 2.75 pints/A were applied every 6-9 days with insecticide.

Irrigation: No irrigation was needed.

Harvest: Once-over harvest of marketable ears only as each cultivar reached maturity.

Results and Discussion

See Table 1 for results and data.

As it was last year, this year's weather included a warm spring which allowed an early start-up in this plot. Plants emerged quickly and made quick progress. A dry period prevented the weed control materials from being as effective as we needed. There was a need for hand labor to keep the weeds from seriously competing with the corn. Earworm levels were never high, but several sprays of Pydrin were applied for insurance when pheremone traps indicated adult moths were in the area. Other insects never threatened the plot.

Obviously, the earlier the harvest, the more profit potential in sweet corn, all other factors being equal. Unfortunately, the earlier cultivars tend to be of lessor quality, especially those less than 60 days. This year 'Earlivee' proved to be an exception. It was the earliest cultivar by several days yet it looked as good as most of those harvested early. It will be in next year's plot to see if it can be consistent.

Tipfill is an important characteristic in determining the quality of a cultivar. Less than half of the cultivars tested had consistently good tipfill. Most of those could be classified as "second early" types. A number of Stokes cultivars fell into this class, including 'Springdance', 'Yukon', 'Norsweet' and 'Norgold'. Asgrow's 'Comanche' looked very good and was very productive as well. 'Aztec' from Asgrow also looked good but didn't yield as well as 'Comanche'. An experimental line 'RXY 6901', from Robson Seed looked very good. Among the "first early" cultivars, 'Spirit' from Rogers was very productive with good size and appearance. '79/1888' from Rogers was a very large ear for an early cultivar. This cultivar also had large kernels but its appearance was of lessor quality. 'Debutante' from Abbott and Cobb looked good and produced especially well but was rather late.

Best First Early Yellow Sweet Corn Cultivar for 1986: 'Spirit'
Best Second Early Yellow Sweet Corn Cultivar for 1986: 'Comanche'

Table 1. Harvest Data

Cultivar	Source	Harvest Date	Total Pt Ears	Total Ear Wt	Ave Ear Length	Pt Rows	Tip-Fill	Kernel Size/Color		Blanks
Earlivee	SS	7/13	25.0	14.2	6.25"	12	good	sm	lt	some
Spring Gold	HM	7/15	14.2	14.3	6.50"	12	fair	md	md	yes
Sundance	HM	7/15	21.0	13.6	7.00"	14	fair	md	lt	some
79/1888	R	7/15	26.3	19.8	8.00"	14	fair	lg	md	some
Spartan	SS	7/15	16.6	11.2	7.25"	14	poor	md	md	yes
4th of July	EM	7/15	19.0	12.2	7.00"	12	fair	md	md	no
Earlibelle	HM	7/15	24.3	15.9	7.50"	16	fair	sm	md	yes
Seneca Horizon	HM	7/15	19.0	11.4	7.00"	14	fair	lg	md	some
Dawn Corn	VBS	7/15	23.0	13.8	6.75"	14	fair	md	md	yes
Early Golden Giant	BUR	7/15	11.0	7.7	6.75"	14	fair	lg	md	some
Pride of Canada	EM	7/15	15.0	14.5	6.50"	12	fair	md	md	no
Classic Touch	VE	7/15	29.3	14.7	6.75"	14	good	sm	bic	no
Spirit	R	7/15	30.3	22.6	7.50"	14	fair	md	md	no
Debut	R	7/23	28.5	20.8	7.25"	16	good	md	md	no
Northern Belle	HM	7/23	27.6	21.7	7.50"	16	fair	md	md	some
Comanche	A	7/23	29.5	20.6	7.75"	16	good	md	md	no
Northlite	SS	7/23	17.0	11.3	8.00"	13	fair	lg	md	some
Rival	A	7/23	36.0	25.2	7.50"	15	fair	md	md	yes
RXY 6901	RS	7/23	27.3	17.6	8.25"	14	good	md	md	some
Early Sunglow	BUR	7/23	21.6	10.7	6.75"	12	good	lg	md	some
Norgold	SS	7/23	30.0	20.1	7.50"	16	good	sm	lt	some
Springdance	SS	7/23	29.3	19.7	7.50"	15	good	md	md	some
Yukon	SS	7/23	27.7	19.4	9.00"	15	good	md	md	some
Precendent	CR	7/23	25.0	18.3	7.75"	17	fair	md	md	some
Aztec	A	7/23	19.0	13.9	7.75"	16	good	md	md	yes
Norsweet	SS	7/23	23.3	17.7	7.50"	16	good	md	lt	no
82-2203	R	7/23	22.0	13.3	7.75"	18	fair	md	lt	some
80-2216	R	7/23	28.0	22.1	7.75"	18	fair	md	lt	some
Sunburst Imp	SS	7/23	19.0	13.3	8.25"	15	fair	md	md	no
Blitz	HM	7/23	20.0	10.7	6.50"	13	fair	lg	dk	no
Debutante	AC	7/30	32.0	23.5	8.00"	16	good	md	md	no
ARRestor	SU	7/30	32.0	27.6	8.50"	21	fair	md	sm	yes
AVX 2539	SU	7/30	29.0	20.4	8.50"	17	fair	md	lt	some

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sh_2 SWEET CORN CULTIVAR PERFORMANCE EVALUATION

William H. Shoemaker

One of the great revolutions in vegetable breeding in recent years has been the discovery and use of various genes that increase sugar levels in fresh sweet corn. The new cultivars resulting from these breeding programs are causing consumers to rediscover sweet corn. Perhaps more than any other, the sh_2 gene has contributed to the new popularity of "super sweet" corns. Many of the more popular super sweet corn cultivars have the sh_2 gene in their genetic background. The St. Charles Horticulture Research Center is placing special emphasis on keeping up on new developments in super sweet corn. Cultivar evaluations play an important part. This is the second in a series of sh_2 cultivar evaluations.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Drummer Silty Clay Loam

Plot Layout: One 30' row, rows 36" apart, 3 reps, guard rows.

Planting: Direct-seeded w/jab planter on 5/21/86, 3/4" deep, population 17,500/A.

Fertility: Applied N, P, K preplant, disced in, at following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb PO4/A as 18-46-0
K at 125 lb K20/A as 0-0-62

Sidedressings of 25 lb N/A as NH_4NO_3 at 4 weeks.

Weed Control: Applied a tank-mix of Aatrex/Sutan ppi, disced in at following rates:

Aatrex Nine-O at 3.0 lb aia
Sutan+ 6.7E at 3.0 lb aia

Cultivation as needed

Insect Control: A maintenance spray program was initiated at the first sign of silking. Insecticide was applied using a high-boy with directed-nozzle drops. The following rates were used:

Pydrin at .15 lb aia, or
Sevin at 1.0 lb aia tank-mixed with Lannate at 0.45 lb aia.

Sprays were applied every 3-4 days.

Disease Control: A maintenance spray of Bravo 500 at 2.75 pints/A was applied with the insecticide every 6-9 days for rust control, once rust was found.

Irrigation: None was used.

Harvest: A once-over harvest of mature ears only.

Data: Average of 3 reps, 30' rows at 17,500 plants/A.

Results and Discussion

See Table 1 for harvest data.

The early warming temperatures experienced during April and May made it possible to have excellent germination and emergence rates. However, a heavy rain caused excessive soil moisture and some standing water in the plot while germination and emergence were taking place. This placed difficult pressure on the cultivars, creating an interesting test of seed and seedling vigor. The results are seen in Table 1 under percent stand.

No other serious problem occurred in the plot. Signs of rust didn't occur until the later cultivars were near tasselling. Earworm pressure never became great and corn rootworm beetles didn't have an impact. Soil moisture was low during the latter part of the harvest but was not a limiting factor.

It was exciting to see how much breeding work is going on in the area of sh_2 sweet corn. Many of the cultivars tested have just been released within the last two or three years. Several cultivars haven't been released as yet. Sixty two cultivars were evaluated this year, allowing a good look at what's available. Different seed companies have different criteria so there is some subjectivity involved in evaluating these cultivars. Nevertheless, the marketplace is where the best will be determined.

Certainly a remark should be made concerning the new cultivars from Harris Moran Seed. As a group, their new generation of sh_2 cultivars have appearance that serves as a model for the industry. Ears are the optimum size with a balanced shape and kernel size to go with it. Tips and sides fill out well. Plant stand was also very good. This group includes the cultivars Pinnacle, Landmark, Zenith and HMX 4370S. Pinnacle and Zenith in particular stood out.

Other yellow cultivars that looked good included an entry from Takii Seed in Japan, Skyliner 95. This cultivar had good all around characteristics. Ear quality was very good. It's only drawback might be plant height. It was almost a foot taller than any other cultivar. It may be susceptible to lodging. An entry from Robson Seed that looked good was Seneca RXY 8301. Despite an average plant stand it had above average production. XPH 2559 from Asgrow had a very good plant stand and number of ears was good but ear weight was a little low. Florida Staysweet was typically good and had a good plant stand. Sugar Buns was a good looking early hybrid from Burpee. SCH 4041 and SCH 4051 from Illinois Foundation Seed were good looking,

productive experimentals. Sweetie, from Sun Seed, was very good looking and productive, suffering only from a plant stand that was fair at best. Summer Sweet 7700 from Abbott and Cobb was good overall as was Merlin Super Sweet from Stokes.

Of the bicolors, several looked very good. Summer Sweet 7802 from Abbott and Cobb had high production figures and a very good plant stand. Ear quality was excellent. Another bicolor which was excellent was SCH 4407. Productivity was very high. Its ears were very presentable, especially with the small kernels in a bicolor. Another experimental hybrid from Johnny's Seed that had good looking ears was JX 8510 XS. It didn't produce quite as well as the other two though. Ivory N' Gold from Illinois Foundation Seed also did very well. It might interest growers who prefer a large kernel in a bicolor.

Only three cultivars in this evaluation were white and all of them did well. Summer Sweet 8601 was excellent, with high productivity and great ear quality. Plant stand was also good. Summer Sweet 8502, a slightly later hybrid, was good but not as productive. The other hybrid, How Sweet It Is, was the best white sh_2 in last year's plot. This year, production was good but down a little. Ear quality was excellent.

Best Yellow sh_2 for 1986 = Pinnacle

Best Bicolor sh_2 for 1986 = Tie - SCH 4407
Summer Sweet 7802

Best White sh_2 for 1986 = Summer Sweet 8601

Table 1. sh_2 Sweet Corn Harvest Data

Cultivar	Co.	Harv Date	No. of Ears	Wt of Ears (lb)	Rows Per Ear	Ave Ear Lgth	Kernel Size	Kernel Color	Tip Fill	Blanks	Per Cent Stand
How Sweet It Is	CR	8/12	18.7	13.0	18	7.75"	md	Wh	good	none	71
FMX 81	FM	8/12	14.0	10.8	14	8.50	lg	md	good	few	49
Springsweet	SS	8/12	14.0	10.3	18	8.00	md	md	fair	few	59
Summer Sweet 7800	AC	8/15	18.0	14.2	16	7.50	md	lt	good	some	67
Sugar Loaf	SU	8/12	27.7	20.8	16	7.50	md	md	fair	none	78
FMX 46	FM	8/5	22.0	16.1	16	7.75	md	md	fair	few	63
Summer Sweet 7900	AC	8/18	16.0	12.6	20	8.50	sm	md	good	few	67
81-2945	R	8/5	18.0	17.2	16	8.00	md	md	good	few	67
Royal Super Sweet Extra Early	RO	8/1	5.3	3.3	12	7.00	lg	dk	fair	few	43

Table 1. sh_2 Sweet Corn Harvest Data (continued)

Cultivar	Co.	Harv Date	No. of Ears	Wt of Ears (lb)	Rows Per Ear	Ave Ear Lgth	Kernel Size	Kernel Color	Tip Fill	Blanks	Per Cent Stand
Seneca RXY 8301	RS	8/12	25.3	18.8	16	8.00	md	md	fair	no	62
Summer Sweet 6700	AC	8/5	5.0	3.5	16	7.50	lg	md	fair	some	61
Crisp N' Sweet 710	CR	8/12	19.7	17.7	16	8.50	md	md	good	some	69
Skyliner 95	TA	8/15	24.7	21.1	16	8.50	md	md	good	few	70
Summer Sweet 8601	AC	8/12	28.3	21.2	18	7.50	md	WT	good	no	72
81-2946	R	8/5	13.3	14.6	18	8.50	lg	md	fair	few	61
XPH 2559	A	8/5	25.0	16.2	16	7.50	md	md	fair	few	81
Zenith	HM	8/12	19.0	13.7	16	7.50	md	lt	good	no	59
Florida Staysweet	HM	8/12	23.7	15.2	16	7.50	md	lt	good	some	76
Butterfruit Bicolor	P	8/15	17.3	13.5	20	8.00	sm	BI	good	few	48
FMX 79	FM	8/5	19.3	13.2	16	8.00	md	md	fair	few	80
Northern Super Sweet	SS	7/30	14.3	10.2	12	8.25	lg	md	good	few	67
HMX 4370S	HM	8/1	18.5	12.0	12	7.50	lg	dk	good	no	85
Sweet Belle	A	8/15	18.3	14.2	20	8.00	sm	md	good	few	64
Milk N' Honey	SS	8/12	27.0	17.7	16	8.00	md	BI	fair	no	72
Ultimate	HM	8/12	19.7	14.8	18	7.50	md	md	good	some	65
81-2949	R	8/5	17.0	11.3	16	7.00	md	lt	good	few	69
Ivory N' Gold	I	8/12	25.7	17.2	16	8.00	lg	BI	good	no	69
Landmark	HM	8/5	25.3	18.6	12	8.00	lg	dk	fair	some	77
Butterfruit	P	8/5	25.5	19.2	12	8.00	lg	md	fair	no	57
Sugar Buns	BUR	7/30	19.0	10.9	14	7.25	md	lt	good	some	66
SCH 4405	I	8/5	17.7	12.1	16	8.00	md	BI	fair	no	53
SCH 4407	I	8/12	30.0	21.7	20	7.50	sm	BI	good	few	65
Pinnacle	HM	8/5	30.3	22.0	16	8.50	md	md	good	some	83
Illini Gold	I	8/5	20.3	12.6	16	8.00	md	md	poor	yes	71
SCH 5005	I	8/5	5.7	4.5	16	8.50	md	lt	good	yes	21
Star Struck	JSS	8/12	15.3	11.3	14	8.00	md	BI	fair	few	55
Summer Sweet 7200	AC	8/12	19.0	18.8	18	8.50	md	md	good	few	72
Crisp N' Sweet 720	CR	8/15	23.0	17.8	20	8.00	sm	md	fair	some	80
Summer Sweet 7802	AC	8/12	28.0	18.4	16	7.00	md	BI	good	no	78
SCH 4035	I	8/5	15.3	10.5	16	8.00	md	lt	fair	few	56
Sweet Treat	FM	8/5	13.7	10.1	16	8.50	md	md	good	some	63

Table 1. sh_2 Sweet Corn Harvest Data (continued)

Cultivar	Co.	Harv Date	No. of Ears	Wt of Ears (lb)	Rows Per Ear	Ave Ear Lgth	Kernel Size	Kernel Color	Tip Fill	Blanks	Per Cent Stand
Skyliner 85	TA	8/12	9.3	6.8	14	8.00	lg	md	poor	no	56
FMX 244	FM	8/12	21.0	17.3	18	8.50	md	BI	good	few	68
SCH 5009	I	8/5	17.3	11.2	14	7.50	lg	md	fair	no	81
Burpee's Sugar Sweet	BUR	8/15	14.3	9.3	14	7.00	md	lt	good	few	59
JX 8510 XS	JSS	8/12	20.7	13.2	16	7.50	md	BI	good	no	72
SCH 4041	I	8/12	29.0	23.6	14	9.00	lg	md	fair	no	75
Honeycomb	SU	8/5	17.7	11.6	14	8.00	md	md	poor	few	56
SCH 4051	I	8/15	24.0	19.0	14	8.00	md	md	good	few	66
Merlin Super Sweet	SS	8/12	25.0	17.4	18	8.00	md	lt	good	no	63
Crisp N' Sweet 690	CR	8/5	21.3	15.4	16	8.00	md	md	poor	no	69
FMX 77	FM	8/15	17.0	14.7	16	7.50	md	md	fair	yes	53
SCH 4005	I	8/5	10.7	9.0	12	7.50	lg	lt	fair	few	56
Sweetie	SU	8/15	24.7	19.0	16	7.50	md	md	good	few	58
Honeybar	TA	8/12	14.7	11.4	16	8.50	md	md	fair	no	32
Crisp N' Sweet 700	CR	8/12	23.7	16.8	16	8.00	md	md	fair	some	68
Summer Sweet 7700	AC	8/15	23.7	17.2	20	8.00	md	md	good	few	70
Summer Sweet 8502	AC	8/15	21.0	15.1	20	7.50	sm	WT	fair	few	59
Summer Sweet 7600	AC	8/15	15.7	10.8	14	7.25	md	lt	good	few	56
Xtra Sweet '82	EM	8/5	11.0	8.2	14	8.00	md	md	poor	yes	49
FMX 76	FM	8/5	13.7	10.3	16	7.50	md	md	fair	yes	52
FMX 235	FM	8/5	12.3	9.2	16	9.00	lg	md	fair	yes	44

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se SWEET CORN CULTIVAR PERFORMANCE EVALUATION

William H. Shoemaker

Sweet corn has always been an important vegetable for Illinois vegetable growers. In the fresh market, eating characteristics of a cultivar play a big part in determining whether that cultivar will be popular with a consumer and eventually with the grower. With the advent of the super sweet corn types, a revolution in sweet corn cultivars is determining what the sweet corn of the future will be. One of the more important factors in this revolution is the development of cultivars with the se gene (sugary enhancer gene) that are higher in sugar than standard cultivars. These cultivars are examined in this evaluation for production and fresh market quality characteristics.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: A single 30' row, replicated three times with guard rows.

Plantings: Seeds were planted on April 25 with a jab planter at a depth of 5/8" and a population of 17,500 plant/acre.

Fertility: Applications of N, P and K were made at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb P04/A as 18-46-0
K at 125 lb K20/A as 0-0-62

A sidedressing of 25 lb N/A as NH4N03 was applied.

Weed Control: An aatrex/sutan tank mix was applied ppi, double disced at the following rates:

Aatrex Nine-0 at 3.0 lb aia
Sutan+ 6.7E at 3.0 lb aia

Cultivation was used as needed.

Insect Control: Lorsban 4E was applied as a tank mix with the herbicide at 1.0 lb aia. Earworm and Corn Rootworm Beetle control on the silks was provided by spraying Pydrin at 0.15 lb aia as a directed spray with a high-boy sprayer at silk emergence through harvest.

Disease Control: Bravo at 1.5 aia was applied once a week once signs of rust appeared to those plots which had not yet tasseled.

Irrigation: No irrigation was used.

Harvest: Harvest consisted of a once harvest of marketable ears only.

Data: Average of 3 reps, each plot 30' long, maximum of 36 plants.

Results and Discussion

See Table 1 for harvest data.

Conditions in this year's plot were near ideal, although soil moisture was somewhat limited at harvest time. This may have contributed to the high number of cultivars with poor tip fill. Soil temperatures at planting were warmer than normal, allowing the plants to establish quickly. Plant growth made good progress right up to harvest. Very few problems were encountered in the plot.

This year's top performers were not last year's top performers. Silverado, which performed so well last year was only slightly better than average this year. Its production figures were lower and there were some problems with appearance that weren't seen in '85, particularly a tendency for the ear, which is typically slender, to arch or bend a bit. Also, Snowbelle, which was again a very good looking white ear, didn't yield as well as some of the others as its plant stand was only about 65-70%. Miracle, a yellow hybrid, suffered a little more problem with tipfill than normally seen. Still, its production was very high and should remain a favorite. Phenomenal, a relative of Miracle from Crookham Seed, performed very much like Miracle this year. It's a taller plant, slightly later than Miracle and is a bicolor.

Several cultivars which performed very well included Seneca Sentry, Prevailer and a couple of experimental lines from Rogers Seed (which is doing a lot of very good work with se types), 84-2424 and 84-2429. Seneca Sentry and Prevailer were similar in that their production figures were both very high but they suffered a bit from blanks on the ear. The Rogers experimentals were both very productive also. 84-2424 had tipfill problems though they were minor. 84-2429 was outstanding with only widely scattered incidence of blanking. It's a large ear with small kernels, very attractive.

Just a special mention of a cultivar from Musser Seed, 84-1108. It was a very long ear that was very cylindrical. Weight per ear was very high so it might be a good processor. Its unique look may also attract fresh market customers.

Best Yellow se Sweet Corn for 1986 = 84-2429

Best Bicolor se Sweet Corn for 1986 = Phenomenal

Best White se Sweet Corn for 1986 = Silverado

Table 1. se Sweet Corn Harvest Data

Cultivar	Source	No. of Ears	Total Ear Wt.	Rows Per Ear	Ave Ear Lgth	Kernel Size	Kernel Color	Tip Fill	Blanks	Plant Stand
Crusader	SS	24.3	20.9 lb	18	7.75"	md	md	good	some	vgood
Earliglow	BUR	29.7	18.2	14	7.50	md	md	fair	some	vgood
H-233	SW	27.7	14.7	18	8.00	sm	lt	poor	yes	vgood
Kandy Korn	EM	23.3	16.0	16	8.25	md	md	fair	some	vgood
84-1108	MU	27.0	20.3	16	8.50	md	lt	good	yes	vgood
Crystal Bell	SW	30.3	18.3	16	7.50	sm	WT	fair	no	good
Prevailer	AC	34.0	25.8	18	8.00	sm	md	good	some	vgood
Silverado	HM	29.0	17.2	16	8.00	md	WT	good	some	vgood
Supreme	HM	27.0	18.8	16	7.50	md	md	good	some	good
84-2424	R	32.0	19.7	16	7.75	md	md	fair	no	vgood
84-2429	R	36.0	23.7	18	8.00	sm	lt	good	no	vgood
Snowbelle	A	22.0	13.9	16	7.50	md	WT	good	no	fair
84-93	MU	33.0	20.7	14	7.00	lg	dk	fair	no	good
84-435	MU	23.7	18.5	16	7.50	md	md	good	no	vgood
Platinum Lady	BS	26.7	16.0	12	7.50	md	WT	fair	some	vgood
Summer Flavor 87BC	AC	21.0	12.1	16	7.25	sm	BI	good	yes	vgood
Summer Flavor 82Y	AC	22.7	17.5	18	9.00	lg	md	fair	no	good
Seneca Sentry	RS	33.0	21.4	16	8.00	md	lt	good	some	vgood
H 63	SW	25.0	13.5	16	8.00	sm	BI	poor	no	vgood
H 245	SW	22.0	18.5	18	8.00	md	md	fair	some	vgood
Summer Flavor 79W	AC	22.0	12.0	16	7.50	md	WT	good	no	fair
Miracle	EM	30.3	22.2	18	8.00	md	md	fair	no	vgood
Incredible	CR	24.3	17.6	18	7.50	md	md	fair	no	vgood
Double Delight	AC	20.5	11.6	16	7.25	md	BI	good	yes	good
Phenomenal	CR	32.0	21.3	16	7.50	md	BI	fair	no	vgood
84-2468	R	23.0	13.1	20	7.75	md	lt	poor	yes	good

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JALAPENO PEPPER CULTIVAR PERFORMANCE EVALUATION

William H. Shoemaker

Of the many hot peppers that are currently available, perhaps the jalapeno has the most name recognition among American consumers. The rise in popularity of Mexican cuisine has attracted much attention to the jalapeno, causing an increase in retail demand for that hot pepper. As the public's tastes change, growers may need to produce these new types of crops, not only to sell those crops but to draw more attention to the other crops, they produce. This evaluation is an attempt to help growers get off on the right foot in jalapeno pepper production by testing those cultivars currently being offered on the seed market.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: A single row, 12' long, plants 1' apart, rows 3' apart, 3 replications

Planting: Seeds were started in the greenhouse on April 2 in Pt72 Pro-Trays with Sunshine Mix medium.
Plants were set in the field on June 3.

Fertility: Applications of N, P and K were made on March 27 at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb PO4/A as 18-46-0
K at 125 lb K20/A as 0-0-62

A single sidedressing was made on June 24 at 25 lb N/A using ammonium nitrate.

Weed Control: Treflan 4E at 0.75 lb aia, ppi, double-disced.

Insect Control: Orthene for aphid control was applied twice in the greenhouse at labeled rate. Ladybug populations were good in the field so no spray was used. Tomato Fruitworm was not a problem.

Irrigation: None was used.

Harvest: Three harvests of mature green fruit approximately 2 weeks apart.

Results and Discussion

See Tables 1 and 2 for harvest data.

This plot seemed to have suffered little from the drought which destroyed the bell pepper plot. The bushy plants thrived while fruit set was heavy. The cool August temperatures caused maturation to be slow but eventually the harvests became heavy. No serious disease or insect problems were noted in the field. Weed pressure was higher than it should have been. Almost all of the weeds were velvetleaf. This season pointed out the need for a good broadleaf weed control program in crucifers and the solonaceous crops.

Seven cultivars were submitted for evaluation and real differences were found among them. Several cultivars had compact plant growth which would allow closer spacing and made harvesting by hand simpler. Of these, Jalapa and Early Jalapeno showed promise. In terms of weight, Jalapa was the greatest producer in the plot. In terms of numbers, Early Jalapeno was the greatest producer. Jalapa produced the heaviest early crop both in weight and in number of fruit. It had a distinctive cone shape that was very broad at the stem. It was also very uniform. It's high number of culls may indicate a sensitivity to drought. Early Jalapeno had a greater number of fruit turn red, which is very attractive in a jalapeno.

Of the cultivars which had a larger, more spread growth pattern, only two were productive. Jalapeno M (from Petoseed) and Jalapeno (from Asgrow) both produced in the same range as the two previously mentioned. The larger plant made harvesting slightly more tedious and time-consuming. Fruit appearance was good but not distinctive.

One cultivar which deserves mention is TAM Mild, which is supposed to have a milder flavor. An authority which tested it in the field concluded it was truly milder but perhaps not enough to be noticed by the novice if it is consumed undiluted.

Best Jalapeno Pepper for 1986 = Jalapa

Table 1. Early Harvest Data

Cultivar	Source	No. Fruit	Total Fruit Wt. (lb)	No. Reds	No. Culls
Early Jalapeno	AC	30.7	1.0	3.0	3.3
Jalapeno M	PS	42.0	1.2	0.3	5.7
Jalapa	PS	76.7	2.9	10.0	31.0
TAM Jalapeno	EM	34.3	1.1	3.7	21.7
TAM Mild	P	37.3	1.3	6.3	20.0
Chili Jalapeno	BS	23.3	0.6	0.7	2.0
Jalapeno	A	25.0	0.7	0.0	2.3

Table 2. Total Harvest Data

Cultivar	Source	No. Fruit	Total Fruit Wt. (lb)	No. Reds	No. Culls
Early Jalapeno	AC	536.0	11.1	93.0	12.0
Jalapeno M	PS	527.7	11.5	17.0	14.0
Jalapa	PS	487.7	12.0	62.0	40.0
TAM Jalapeno	EM	282.7	6.1	35.7	33.3
TAM Mild	P	205.3	4.7	28.0	33.0
Chili Jalapeno	BS	315.0	7.1	8.0	13.0
Jalapeno	A	513.0	11.7	14.0	11.0

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WATERMELON CULTIVAR - ROW COVER PERFORMANCE EVALUATION FOR NORTHERN ILLINOIS

William H. Shoemaker

Though watermelons are thought of as a crop that favors sandy soils, many are produced by vegetable growers in Northern Illinois mineral soils. To get maximum production from this crop, row covers are essential. This study examines performance of watermelon cultivars in Northern Illinois under row covers.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Due to space limitations and the large size of the plot, two soil types were included:

Proctor Silt Loam
Drummer Silty Clay Loam

Plot Layout: One 30' row, plants 3' apart, rows 10' apart, 3 reps, guard rows.

Planting: Seeds were set in the greenhouse in Pro-Tray 50's with Redi-Earth mix on 4/22/86. Plants were set in the field with 9-45-15 starter solution on 5/23/86.

Fertility: Applied N, P, K preplant, disced in, at following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb P04/A as 18-46-0
K at 125 lb K20/A as 0-0-62

Sidedressing of N as NH4N03 at 25 lb N/A.

Weed Control: Applied a tank-mix of Prefar/Alanap ppi, disced in at following rates:

Prefar 4E at 4.0 lb aia
Alanap L at 2.0 lb aia

Cultivation as needed.

Insect Control: Furadan 15G at 1.5 lb/1000' of row was applied at planting for cucumber beetle control.

Sevin 80W at 1.0 lb aia was applied at high pressure with a boom sprayer at 7-10 day intervals for cucumber beetle control.

Disease Control: Beginning at fruit set, a maintenance spray program applied fungicide at 7-10 day intervals alternating mancozeb and Bravo at the following rates:

Dithane M45 or Manzate 200 at 2.0 lb/A
Bravo 500 at 2.25 pints/A

When needed for powdery mildew control, Benlate 50W was sprayed with the other fungicide at 0.5 lb aia

Irrigation: None was used.

Harvest: Harvested by slapping fruit to determine ripeness at 3 day intervals. Data was taken on fruit earliness, weight and number. Observations on plant and fruit quality were taken.

Data: Average of 3 replications, 10 plants/rep.

Results and Discussion

This trial suffered more stress than any other in 1986 perhaps because of a near complete failure of the weed control program. Herbicide activity in the broadleaf weeds was near zero while grasses were controlled fairly well. The broadleafs quickly outgrew the melons and, though there was a good fruit set, provided strong pressure to the melons. As a result, fruit size was low and yield of marketable fruit was down. Still, with a cool August and such weed pressure, evidence points to the possibility of achieving good yields under good cultural conditions. Also, drouthy conditions put stress on the plants starting about a week before harvest began and continuing through harvest.

As this trial dealt with medium and full sized melons only, none of the icebox types will be discussed. Of the large types several stood out. Madera, from Asgrow, was a Crimson Sweet type that performed very well. It is a slightly elongated striped melon with a "dusty" finish rather than a shiny appearance. It maintained good size and harvested a good number of melons. Charleston 76 was slightly smaller but produced a large number of marketable fruit. AVX 5500 from Sun Seed was one of the largest fruit yet was also prolific. It was also earlier than most of the other cultivars. It's a large round fruit with a Charleston Gray coloring that sometimes gets a distorted shape (bumpy, slightly twisted). Interior color of this cultivar was good. Florida Giant, from Asgrow, also known as Black Diamond or Texas Cannonball, maintained a good average size although it wasn't highly consistent. We had one specimen weigh over 34 pounds. Au-Jubilant, from Hollar Seed, maintained very good size though production was a bit low. It, like Jubilee, has very large seeds. Dixielee, a round striped melon from Abbott-Cobb, was fairly productive and very good quality.

Of the medium sized melons, Sweetmeat II was superior. It was a solid dark green elongated melon with rich red flesh and very good flavor. It produced more melons than any other cultivar. Summer Festival was also good, producing almost as many melons. Triple Sweet seedless and XPH 5078 were slightly behind in productivity but were both very good quality.

Table 1. Watermelon Harvest Data

Cultivar	Source	No. of Fruit	Total Wt (lb)	Average Wt (lb)	Description
Calhoun Gray	T	8	119.5	14.9	Charleston Gray type
Baronet	A	9	121.5	13.5	Long solid green fruit
Royal Sweet	AC	13	187.6	14.4	Elongated striper
PS 19981	PS	13	192.6	14.8	
Oasis	HM	14	198.3	14.2	Elongated striper
Allsweet	BS	12	159.9	13.3	Long striped melon
Au-Jubilant	HO	11	223.0	20.3	Jubilee type
MOX 1568	HM	14	209.6	15.0	Similar to Oasis
Iopride	HM	10	178.2	17.8	Round dark striper
Rebel Queen	FM	16	234.6	14.7	Elongated striper
Prince Charles	EM	11	181.1	16.5	Charleston Gray type
Charleston Elite	NK	11	202.3	18.4	Charleston Gray type
XPH 5078	A	16	184.1	11.5	Long dark green fruit
Sundance	A	15	173.8	11.6	
Madera	A	16	281.4	17.6	Crimson Sweet type
Royal Jubilee	HM	7	132.7	19.0	Jubilee type
Crimson Sweet	BS	11	169.3	15.4	Round striper, standard
AVX 5500	SU	18	341.1	19.0	Large round, gray type
Sweetmeat II	PS	25	260.9	10.4	Elongated dark green
Mirage	A	18	235.8	13.1	Elongated striper
Sunshade	A	9	142.9	15.9	Charleston Gray type
Dixielee	AC	14	242.1	17.3	Round striper
Peacock	HM	9	95.9	10.7	Elongated dark green
Calsweet P.V.P.	HO	13	202.5	15.6	Elongated striper
Sweet Charlie	NK	16	216.7	13.5	Charleston Gray type
Triple Sweet	T	19	191.5	10.1	Seedless, round striper
Charleston 76	HM	22	347.5	15.8	Charleston Gray type
Southern Belle	FM	21	229.7	10.9	Round, very dark green
Dixie Queen	BUR	11	139.7	12.7	Round striper
Royal Crimson	PS	12	153.4	12.8	Round striper
Jubilee	A	7	106.5	15.2	Long striper, lg seeds
XPH 5081	A	24	141.2	5.9	Round dark striper
Bush Jubilee	EM	6	69.8	11.6	Jubilee type
Florida Giant	A	14	253.9	18.1	Large round black
Summer Festival	HM	23	248.2	10.8	Small Charleston Gray
Royal Peacock	T	17	243.1	14.3	Elongated black melon
NVH 4258	NK	15	221.0	14.7	Elongated striper
Royal Windsor	AC	9	155.4	17.3	Charleston Gray type
AU-Producer	HO	13	194.7	15.0	Crimson Sweet type

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CABBAGE CULTIVAR PERFORMANCE OBSERVATION

William H. Shoemaker

Among those vegetables for fresh market which growers in Illinois commit much acreage to, cabbage certainly plays an important part. While many growers may plant ten or twenty acres, there are others who plant hundreds of acres. There are over one hundred cultivars for a grower to choose from, each with unique characteristics. This evaluation is the first of several which will determine which cultivars are superior for Northern Illinois.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: One row 15', plants 1.5' apart, rows 3' apart, guard rows

Planting: Started in greenhouse 4/3/86 in Pro-Tray 98's using Jiffy-Mix Medium. Plants were set in the field on 5/8/86.

Fertility: Applications of N, P and K were made at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb P04/A as 18-46-0
K at 125 lb K20/A as 0-0-62

A sidedressing of N at 25 lb N/A as NH4N03.

Weed Control: Treflan 4E at 0.75 lb aia, ppi
Cultivation as needed

Insect Control: When needed, insecticide sprayed with a boom sprayer at high pressure, including:

Dipel for Imported Cabbage Worm
Lannate for Cabbage Looper
Sevin for Flea Beetle

Disease Control: None used

Irrigation: None used

Harvest: Selective harvest of mature heads only.

Data: 15' of row, 10 plants

Results and Discussion

See Table 1 for harvest data.

The season turned out to be a good one for cabbage, particularly for early cultivars. Early warm weather, more sunshine than normal and good, healthy transplants all contributed to a great start for the plants. Problems that did occur were not difficult to deal with and were to be expected. Imported Cabbage Worm moths were seen in early June so larvae became a pest soon after. Dipel as a preventative spray controls damage from this pest. Flea Beetles were not the problem they have been in the past. Cabbage Looper, a more difficult pest, was later in the season but needed controlling for the late cultivars. Lannate did a good job with that pest.

The number of cultivars available on the market is overwhelming. The seed companies seemed intent on impressing that point on me as there were more than 75 cultivars in the plot. Several cultivars had to be left out as they arrived at the Research Center too late to start transplants. The size of the plot and the season both contributed to the difficulty in taking data off the plot so information is limited to head weight and size and core length and thickness. Further investigations will attempt to reduce plot size and intensify analyses.

Table 1. Cabbage Cultivar Harvest Data

Cultivar	Source	Harv Date	Average Wt (lb)	Average Head Width	Average Head Height	Average Core Length	Average Core Thickness
Polar Green	SS	7/1	2.9	5.8"	6.0"	2.8"	1.5"
Charmant	SA	7/7	2.9	5.9	5.8	2.9	1.8
OS Cross	TA	7/18	6.7	12.3	5.8	2.6	1.6
Rio Verde	NK	7/18	4.6	7.6	5.8	3.0	1.5
Tri Star	BUR	7/7	2.5	6.9	5.3	2.8	1.5
Chogo	SA	7/3	3.3	6.0	6.9	3.0	1.6
New Green	TA	7/7	3.4	8.0	5.6	2.4	1.1
Danish Ballhead	HM	7/18	3.6	6.3	5.6	3.1	1.5
Viking	AG	7/7	3.0	6.9	6.4	3.6	1.8
Tucana	RO	7/1	2.6	5.8	5.9	2.8	1.4
Lasso	JSS	7/7	1.4	5.0	5.1	2.8	1.3
Grenadier	SS	7/1	3.2	6.8	6.5	2.8	1.5
XPH 5116	A	7/18	5.6	6.3	6.1	3.4	1.4
Globe Master	TA	7/18	6.0	7.3	6.6	2.8	1.3
XPH 5114	A	7/3	2.8	6.5	6.5	3.5	1.3
Ocala	SU	7/18	4.2	7.3	6.1	3.4	1.5
Solid Blue 760	AC	7/1	2.4	5.9	5.6	2.9	1.5
Sure Vantage	SA	7/18	3.1	6.5	6.0	3.4	1.5
Perfect Action	JSS	7/21	3.5	6.3	5.6	2.3	1.5
Solid Blue 690	AC	7/7	2.7	5.8	5.6	2.6	1.6
Vantage Point	SA	7/21	5.2	7.4	7.5	4.1	1.5
Solid Blue 700	AC	7/3	3.0	6.5	6.8	3.0	1.5
Golden Acre	PS	7/3	3.1	6.6	6.4	2.9	1.6
Sanibel	PS	7/11	4.0	6.8	6.8	3.6	1.6
Regalia	SS	7/1	4.1	7.0	7.0	3.0	1.4
Hermes	RO	7/1	3.2	6.8	6.4	2.4	1.4
Resist Crown	TA	7/3	2.6	6.9	5.1	2.4	1.3
Grand Slam	NK	7/11	4.4	8.0	7.1	3.6	1.4
Head Start	A	7/1	3.8	7.3	7.4	2.8	1.5
Ruby Perfection	SS	7/31	2.6	5.0	6.0	2.8	-
Safekeeper	SS	7/31	4.2	6.5	7.0	3.5	-
Bislet	AG	7/31	3.2	5.8	6.5	3.0	-
Storage Red	SS	7/31	1.3	3.9	5.8	2.8	-
Dynasty	A	7/1	3.3	6.9	6.4	3.1	1.4
Perfect Ball	JSS	7/31	4.1	6.0	6.8	2.5	-
Ruby Ball	AC	7/7	2.7	6.1	5.9	3.8	1.4
Stonehead	EM	7/7	2.9	5.9	5.6	2.5	1.6
Winterkeeper	SS	7/31	4.2	7.0	6.5	3.5	-
Market Topper	HM	7/7	3.1	6.4	6.0	3.5	1.5
Shamrock	PS	7/7	3.5	6.8	6.5	2.8	1.6
Red Acre	BUR	7/7	2.5	6.0	5.9	2.9	1.5
Conquest	A	7/7	3.3	6.5	6.1	4.5	1.5
Scorpio	SA	7/7	3.5	7.0	6.9	4.1	1.6
Pak Rite	SA	7/1	3.0	6.5	5.9	3.0	1.5

Table 1. Cabbage Cultivar Harvest Data (continued)

Cultivar	Source	Harv Date	Average Wt (lb)	Average Head Width	Average Head Height	Average Core Length	Average Core Thickness
Jumbo	SS	7/31	5.4	6.5	8.5	4.0	-
PSX 53880	PS	7/1	3.0	6.6	5.9	2.8	1.1
XPH 5112	A	7/7	3.4	7.0	7.3	4.3	1.8
Princess 39	AG	7/1	2.9	6.9	6.1	2.9	0.9
Blueboy	T	7/21	6.5	8.9	6.8	3.6	1.6
Tastie	BS	7/1	3.9	6.8	6.8	2.9	1.5
Cabaret	HM	7/21	3.3	6.5	7.0	2.5	1.3
Alamo	HM	7/21	6.7	7.6	7.3	2.9	1.6
Grand Prize	PS	7/7	3.6	6.4	6.5	3.4	1.8
Arco 206	AR	7/21	6.0	8.3	8.5	3.8	1.6
Premium Late Flat Dutch	A	7/21	4.8	8.4	5.3	2.8	1.3
Survivor	SS	7/21	5.4	7.5	6.9	3.8	1.5
Blue Pak	SS	7/7	2.5	5.6	5.8	3.0	1.6
Market Victor	HM	7/1	3.3	7.0	7.0	2.5	1.4
Solid Blue 770	AC	7/21	6.2	8.3	8.1	3.9	1.4
Superpack	JSS	7/7	2.6	6.0	5.6	3.4	1.8
Hybrid H	HM	7/31	3.8	6.5	6.0	4.0	-
Pierrette	SS	7/7	2.8	6.5	5.9	3.4	1.6
Blue Vantage	SA	7/11	4.3	6.9	6.9	3.4	1.4
Preko	P	7/7	2.2	5.6	5.5	2.5	1.3
57-368	TA	7/7	2.5	6.5	5.9	2.8	1.8
Quisto	NK	7/21	4.7	6.9	6.0	3.0	1.6
Market Prize	HM	7/7	2.1	6.1	5.5	3.8	1.5
Red Rookie	SA	7/11	3.0	5.9	6.0	3.4	1.4
NVH 672	NK	7/11	3.7	7.4	6.5	3.1	1.5
Olympic	NK	7/21	6.2	8.1	7.5	4.8	1.5
Casio	RO	7/1	3.7	7.0	6.8	3.8	1.0
Delphi	RO	7/21	6.8	7.4	7.8	4.1	1.6
Solid Blue 780	AC	7/21	4.0	7.5	6.9	3.5	1.8
Solid Red 781	AC	7/11	3.9	6.9	6.5	4.0	1.5
Canada Savoy	SS	7/11	3.7	9.0	8.1	3.8	1.5

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MIXED MELON CULTIVAR PERFORMANCE OBSERVATION

William H. Shoemaker

One of the great pleasures of summer is sampling fresh melons grown locally. In northern Illinois, few growers make melons their main crop but many grow melons. They're generally profitable and they attract people to the market. Many cultivars are available. This evaluation is an attempt to screen cultivars currently available for northern Illinois melon production.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: A single 30' row, unreplicated with guard rows. Plants were 2' apart, rows were 10' apart.

Planting: Seeds were started in No. 52 Pro-Trays with a peat-lite growing mix on May 2. Plants were set in the field on June 4.

Fertility: Applications of N, P and K were made at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb PO_4/A as 18-46-0
K at 125 lb K_2O/A as 0-0-62

A starter solution of 9-45-15 was used at planting. Side-dressed with 25 lb N/A as NH_4NO_3 at 3 weeks.

Weed Control: Applied Prefar 4E at 4.0 lb aia tank-mixed with Alanap L at 2.0 lb aia, ppi, double-disced. Hand-weeding was used when necessary.

Insect Control: At planting an application of Furadan 15G was made at 1.0 lb/1500' of row and the plants were sprayed with Sevin from a hand sprayer at the labeled rate. At 5 weeks a spray program of 1.0 lb aia Sevin sprayed overtop with a boom sprayer every 7-10 days was begun.

Disease Control: A maintenance program was initiated at fruit set that consisted of alternate sprays of Bravo 500 and a manco-zeb, applied with the insecticide. Benlate was added for powdery mildew control.

Irrigation: None was used.

Harvest: A twice-weekly or more harvest of mature fruit.

Results and Discussion

See Table 1 for harvest data.

Several factors were present this year which could have set the evaluation back but did not. These included a late start, a cooler than normal August and the presence of atrazine residues in the plot. Several cultivars were set back by atrazine residues so data from those cultivars will not be presented. However, despite these problems many cultivars performed very well. Because August was a dry month there were few foliar disease problems and the spray program eliminated the cucumber beetle as a factor. Plant vigor was very good as illustrated by the fact that the 10' wide row spacing did not prevent the plants from filling out the rows, providing a complete blanket of foliage. The fruit were well protected from sunlight until several harvests beat the foliage down. Especially encouraging were the results from several honeydew cultivars. Though few growers in northern Illinois currently produce honeydews, there may be reason to believe that honeydews could be profitably produced for the farm market or roadside stand.

Several muskmelon cultivars deserve mention for outstanding qualities. Harper Hybrid from Harris Moran Seed exhibited excellent all-around attributes. It is a small to mid-size melon with consistent size and shape. It's very round with a small cavity. Its flesh color is a rich salmon. Productivity was very high, producing four marketable melons per plant. Most of those who tested the flavor of the cultivars grown this year rated this cultivar the best. Its only drawback may be that it doesn't have the deep ribs or heavy netting so familiar to midwestern growers and consumers.

Two cultivars that performed very well were Earligold and Earlisweet. Their production figures were outstanding, particularly Earlisweet. Earlisweet was truly early, being within three days of first-to-harvest. Its production quickly climbed to a high level and stayed there through the whole season. This resulted in Earlisweet being more than 50% more productive than any other cultivar. It was a very presentable fruit. Its ribs were prominent but not deep and it was very well netted. Interior qualities were very good. However, it performed poorly in our taste testing. Therefore, it cannot be rated as high as some other cultivars. Still, it should be tested by growers who grow this type of melon. Taste-testing is subjective and more importantly, flavor is easily affected by production factors and may vary with different soil types.

Earligold was also early and productive but what made Earligold stand out was its size and concentrated harvest. It averaged 5.7 lb per melon, which was high in this evaluation. It began harvest three days after the first harvest and was 80% completed two harvests (5 days) later. It was a less attractive melon, lacking rib development but it was well netted. Its major drawback was also flavor, being rated "terrible" by most as it was bland with a strong, disagreeable aftertaste. It must be noted that previous statements about taste-testing apply here as well. Leaf area for sugar development was great so that couldn't be a contributing factor.

Of the traditional midwestern muskmelon types, those which performed best include Burpee Hybrid and a Harris Moran experimental, HXP 3593. Burpee Hybrid began harvest later than most other muskmelons and was not as consistent in size and shape as others but it was very productive and good sized. Eating qualities were also very good. HXP 3593 was a little larger than Burpee Hybrid and got into the bulk of its harvest earlier. Its appearance was similar to Saticoy, which could be a slight drawback depending on the market. Eating qualities were very good. Another which had good production figures was Scoop. It was the earliest cultivar in the plot. However, it didn't hold well in the field, going from immature to overmature in two days in some cases. Its appearance and eating qualities were also fair at best.

Other melons included in this year's plot were honeydews, crenshaws, a French melon and several types difficult to classify. Of the honeydews, several stood out as potentially productive for this area, especially with the use of plastics. Earlidew especially stood out. Its good size (6.1 lb ave.), good flesh quality, earliness and productivity make it stand out. Growers who are considering producing honeydews along with their muskmelons should give this cultivar a trial planting. Be aware however that it has a tendency to crack in the field so fruit should be harvested at 1/4 to 1/2 slip. Yes, these cultivars do slip from the stem at maturity. Venus Hybrid, a smaller cultivar, is another productive honeydew. It was considerably later to harvest than Earlidew. The outside skin will develop a rich yellow cast and occasionally a patch of netting. Flesh is more white than green at maturity but firm and full-flavored. It rarely cracks in the field. Honeydew Orange Flesh was a surprise as its performance in the sandy soils of Illinois was not promising. Its size is similar to Venus Hybrid. It has an attractive, very round shape. Its outside surface is a smooth, pale orange. Its texture and flavor were very good.

The crenshaw melon is not too commonly grown except for local markets, and that usually in more warm climates. Those cultivars in this years evaluation which performed satisfactorily were Early Hybrid Crenshaw and Burpee Early Crenshaw. At 1.3 melons per plant they may not seem productive but the fruit weigh over 10 pounds apiece on the average. Both were of good quality with Early Hybrid being more consistent in size.

Another melon deserves mention. Charmel, a French Charantais-type melon, was a very good performer. It had a long, consistent production period with good productivity during that period. Fruit quality was good, although it did not hold as well as it needs to in the field. Fruit were deeply ribbed, round to slightly oblate with smooth skin. The flesh is orange and sweet. Outside coloring is gray until maturity when it turns a pale orange except between the ribs, where it remains gray. This cultivar slips at maturity. This melon could attract attention to a retail market.

Table 1. Mixed Melon Cultivar Harvest Data

Cultivar	Source	No. of Fruit	Total Wt. (lb)	Average Wt. (lb)	Type of Melon	Comments
TAM Dew Improved	HM	15	78.3	5.2	HD	good look, very late
Harper Hybrid	HM	61	216.1	3.5	MU	good all-around
Superstar	HM	41	238.1	5.8	MU	some 8-10 pounders
Scoop	P	70	201.8	2.9	MU	fair quality at best
Honeydew Orange-Flesh	BS	42	166.2	4.0	HD	good looks, quality
Burpee Hybrid	BUR	65	297.7	4.6	MU	A standard
Charmel	PS	75	191.3	2.6	EX	good quality, nice
Earlidew	PS	60	365.4	6.1	HD	good quality, some cracks, very early
Crenshaw	PS	--	-----	---	CR	Too late for No. IL
Limelight	BUR	21	215.8	10.3	HD	Huge, tasty, late
Laguna	A	20	137.3	6.9	WS	Very large shipper
Honey-Drip	TA	39	267.6	6.9	HD	Bact. wilt problem
84-8446	NI	51	218.9	4.3	WS	Very round shipper
Burpee's Early Crenshaw	BUR	20	199.1	10.0	CR	Good looks, flavor
Earligold	HO	52	294.0	5.7	MU	All traits good except flavor
84-3944	NI	3	21.6	7.2	HD	Not for No. IL
Saticoy	PS	56	235.1	4.2	MU	Late producer
Honeygrow	T	12	88.1	7.3	HD	Not productive here
Harvest Queen	HM	29	115.5	4.0	MU	Old favorite
Honeydew Gold Rind	EM	16	96.6	6.0	HD	Unusual melon
Venus Hybrid	BUR	54	219.5	4.1	HD	Productive, tasty
84-3433	NI	24	75.7	3.2	WS	Not productive
PSX E-680	PS	34	152.6	4.5	MU	Inconsistent size
Market Star	SS	35	127.2	3.6	MU	Inconsistent size
Classic	AC	42	170.1	4.1	MU	Nice-looking
Summet	A	46	173.3	4.1	MU	Very nice melon
HXP 3592	HM	47	218.6	4.7	MU	Looks, tastes good
Conquistador	NK	53	204.9	3.9	MU	Poor netting
Ananas	PS	13	62.4	4.8	EX	White flesh, tasty
Rocky Sweet	HO	36	158.1	4.4	EX	Green flesh, looks like muskmelon
Star Headliner	T	45	197.2	4.4	MU	Inconsistent size
Early Hybrid Crenshaw	AC	20	228.6	11.4	CR	Very nice fruit
Allstar	HM	44	219.7	5.0	WS	Concentrated harvest

Table 1. Mixed Melon Cultivar Harvest Data (continued)

Cultivar	Source	No of Fruit	Total Wt. (lb)	Average Wt. (lb)	Type of Melon	Comments
HXP 3593	HM	60	310.6	5.2	MU	Good eating melon
Columbia	NK	65	236.6	3.6	MU	Small but good
Tanya	A	19	80.7	4.2	WS	Unusual flavor, good
Honeydew	A	2	8.2	4.1	HD	Too late
PSR 10084	PS	34	165.1	4.9	MU	Not impressive
PSR 6682	PS	34	111.7	3.3	MU	Small, poor netting
Sweet n' Early	BUR	66	150.3	2.3	MU	Very round, ribbed
Bonus	TA	--	-----	---	MU	Did not work
Edisto	A	29	106.9	3.7	WS	Late
Earlisweet	SS	119	293.3	2.5	MU	Very productive, good looking fruit

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BRUSSELS SPROUT CULTIVAR PERFORMANCE OBSERVATION

William H. Shoemaker

Among those vegetables which never seem to receive much attention is the Brussels Sprout. It's a long season crop which would seem to have a good potential income but the labor involved in harvesting the crop and preparing it for sale could be overwhelming if each sprout is to be removed from the stalk. A possible alternative is to harvest the entire plant and sell it with the sprouts still intact. This is more likely to work for farm markets, roadside stands and PYO's but it's worth investigating.

Many of the cultivars we use in the United States were developed in Japan, including Jade Cross, Prince Marvel and others. Most of the rest are from Northern Europe. 20 cultivars were found for this year's evaluation, which focused on quality rather than quantity.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Elburn Silt Loam

Plot Layout: A single 20' row, plants 1.5' apart and rows 3' apart. Unreplicated with guard rows.

Planting: Seeds were started in the greenhouse in Pt 98 Pro-Trays with a peat-lite growing mix on May 14. 5-week-old transplants were set in the field on June 18.

Fertility: Applications of N, P and K were made commercially at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb PO4/A as 18-46-0
K at 125 lb K20/A as 0-0-62

Starter solution, 9-45-15, was used at transplanting.

Weed Control: Treflan 4E was applied at 0.75 lb aia, ppi, double disced.
Hand weeding when necessary.

Insect Control: Application of bacillus thuringensis were made on a 7-10 day cycle for worm control. Lannate was used when Cabbage Looper was found. Sevin 80W was used for Flea Beetle control while the transplants were young.

Disease Control: None was used.

Irrigation: None was used.

Harvest: A once-over harvest three weeks after pinching tops. The whole stalk was chopped off at the base with hatchets.

Data: 20' of row, maximum of 13 plants.

Results and Discussion

Growing brussels sprouts was found to be relatively simple. A side-dressing would have been a good idea at about 2 or 3 weeks. Because it was late in the spring when they were started, the transplants were spindly from the lack of environmental control in the greenhouse. This caused the transplants to "gooseneck", or crook at the base. Many of the cultivars tended to lodge later in the year when the tall plants became top-heavy.

A regular schedule of bacillus sprays were necessary to prevent damage by imported cabbage worm larvae. Diseases were not a problem until the middle of September, when 2 weeks in a row of daily rain caused black rot to flourish. There was little difference in cultivars incidence of black rot although the cultivar 'Early Dwarf Danish', which is truly a dwarf, had tightly packed sprouts close to the ground. Black rot moved into those sprouts and the rotting vegetation attracted an unknown fly, which laid eggs, making maggots a problem. This pointed out the need for good air circulation between the sprouts.

There was truly a difference in cultivars. The greatest difference seen was in the consistency of size of sprouts from bottom to top of the stalk. Only one cultivar was consistent, Oliver, from Burpee and Northrup King. All plants were pinched three weeks before harvest, allowing the uppermost sprouts on the stalk to size up. Only Oliver filled out the top sprouts without some of the top sprouts leafing out.

Oliver was easily the best cultivar in other ways as well. It was the only cultivar that showed no lodging at all, other than Early Dwarf Danish. It also had the largest sprouts which, despite their size, were very tight, of high quality. Some cultivars had suckers, sprouts at the base of the plant which became dominant and shot up alongside the main stalk. Oliver had no suckers. Also, the sprouts on Oliver were very attractive, with a smooth surface hinting at the tight sprout.

Other sprouts had some good characteristics as well. Green Marvel was an interesting cultivar. It also had attractive sprouts, with a smooth outer surface, although they were smaller and not as consistent in size. Quite a few cultivars had problems with sprouts at the base leafing out. Green Marvel had less of this than most. It was a shorter plant than Oliver. Prince Marvel and Captain Marvel were similar cultivars from the same source as Green Marvel, Sakata Seed. They both looked promising with tall, vigorous plants with less lodging than most. Sprout size was medium with an attractive look. The biggest problem with both appeared to be inconsistent size. Early Dwarf Danish, despite the problem with black rot, had good sized sprouts that were tight and attractive. It was by far the earliest cultivar in the plot. One other cultivar which looked promising was Valiant. It had many of the right characteristics but to less of a degree.

Table 1. Brussels Sprouts Harvest Data

Cultivar	Source	Comments
Roger	NK	Good sprout size, fair uniformity, fairly smooth, no lodging or suckers.
Crystal	TA	Some lodging and suckers, fair size.
Green Marvel	SA	Slightly smaller plant, sprouts smaller but loaded and smooth, no lodging or suckers, fairly uniform.
Prince Marvel	SS	Good size and uniformity, no suckers, a little lodging, some sprouting at the base, tall plants.
Long Island Improved	EM	Good sprout size but rough, some lodging, no suckers, one barren stalk, some plant loss early.
Lunet	AC	Poor sprout uniformity, too much lodging, some suckers.
Garnet	TA	Some lodging, good sprout size but rough appearance, no suckers.
Pearl	TA	Some lodging, some basal sprouting, poor sprout size and uniformity.
Jasper	TA	Too much lodging, no suckers, sprouts didn't size up well.
Dolmic	RO	Plants not uniform, leaves well projected, providing good air circulation, some lodging and suckering.
Valiant	NK	Some lodging, a little suckering, good sprout size but not uniform.
Perrine	RO	Good sprout size but lacking uniformity, a little lodging.
Emerald	TA	Small sprouts, a little lodging, some suckering.
Oliver	NK	Plants stand up very well, excellent sprout size and uniformity, no suckers or sprouting, outstanding.
Captain Marvel	AC	Plants stand up well, good sprout size and uniformity, looks good.
Acropolis	RO	Some lodging, a little suckering, sprouts not uniform.
Sailor	SW	Good sprout size, tall plants, much basal suckering, lodging a problem.
Early Dwarf Danish	JSS	Determinate growth, large sprouts, densely packed, very short plants, black rot was a problem.
Royal Marvel	SA	Sprouts small, not uniform, some suckering.

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BELL PEPPER CULTIVAR PERFORMANCE OBSERVATION

William H. Shoemaker

Bell peppers are a popular crop among vegetable growers in Northern Illinois. They can be very profitable when the crop yields well and is of good quality. A high number of 4-lobed peppers is desirable as they bring a premium price. The great number of cultivars available makes it difficult for a grower to know which actually perform best in Northern Illinois. This evaluation will be the second in a series of screening bell pepper cultivars for Northern Illinois growing conditions.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: A single row, plants 1.5' apart, rows 3' apart, no replications.

Planting: Started seed in the greenhouse on April 2 in Pt72 Pro-Trays using a peat-lite mix. Transplants were set in the field on June 4.

Fertility: Applications of N, P and K were made on March 27 at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb P04/A as 18-46-0
K at 125 lb K20/A as 0-0-62

A sidedressing of NH4N03 at 25 lb N/A was made at 3 weeks.

Weed Control: Treflan 4E at 0.75 lb aia, ppi, double-disc inc.

Insect Control: In the greenhouse, two sprays of Orthene at labeled rates were made to control Green Peach Aphid. In the field, no sprays were needed. Ladybugs were plentiful and no problems with aphids were found.

Disease Control: No serious disease problems occurred. Aphid control kept viruses from being a problem.

Irrigation: None was provided.

Harvest: Several pickings at about 2 week intervals.

Data: From single 20' row, 13 plants.

Results and Discussion

See Table 1 for harvest data.

This year's evaluation pointed out the disastrous effects of moisture stress on bell peppers. The plants began suffering some drought stress just after fruit set initiated. During the critical fruit development stage, drought stress became worse. It's worth noting that the plants did not show signs of wilting except during periods of high temperatures (>88F) yet lack of moisture had a great effect on fruit quality. A number of cultivars had an average of less than one marketable fruit per plant. Most cultivars had more culls than marketable fruit. Most of these culls were due to blossom-end-rot, a physiological disorder which results when moisture is limited or when it fluctuates. The lack of moisture prevents adequate levels of calcium from reaching developing tissues. These tissues then break down easily and are subject to secondary infections from invading organisms. The disorder occurs characteristically at the blossom end of the plant, where tissues are most rapidly developing.

As it turns out, few cultivars provided more than four marketable fruit per plant, despite the health of the plants which was good. The few which exceeded that level were all characterized by having smaller than average fruit in a typical year. Smaller fruit size provided an "escape" from the problem of moisture stress. Still, each of these suffered significant levels of blossom-end-rot as well.

Many of those which performed the worst included the open-pollinated types which have been popular for years, such as Emerald Giant, Staddon's Select, Keystone Resistant Giant and California Wonder. Each of these averaged less than one marketable fruit per plant. No cultivar could be said to have performed satisfactorily. This only points out the need for the grower to use those tools which are available to him to prevent a disaster. With irrigation, this plot would have provided very good yields.

Best Bell Pepper for 1986 = New Ace

Table 1. Harvest Data

Cultivar	Source	No. of 4-lobe	4-lobe Wt (lb)	No. of non-4-lobe	non-4-lobe Wt (lb)	Total No. of Fruit	No. of culls	% of culls
P-130	NK	9	2.0	5	0.9	14	7	33
New Ace	AC	22	3.3	70	10.3	92	80	47
Olympic	A	8	1.6	7	0.6	15	5	25
Jupiter	NK	8	0.8	8	0.9	16	17	52
Ma Belle	PS	18	1.8	18	2.8	36	75	68
California Wonder	BS	5	0.8	3	0.2	8	25	76
Sweet Belle	FM	5	1.0	5	0.8	10	14	58
Shamrock	A	15	3.0	6	1.5	23	26	55
Bell Boy	AC	12	2.5	25	3.9	37	78	68

Table 1. Harvest Data (continued)

Cultivar	Source	No. of 4-lobe	4-lobe Wt (lb)	No. of non-4-lobe	non-4-lobe Wt (lb)	Total No. of Fruit	No. of culls	% of culls
Klondike Bell	SS	2	0.2	10	1.8	12	18	60
Golden Belle	HM	1	0.2	23	3.5	24	88	79
Bell Captain	SS	14	3.2	14	2.5	28	28	50
Skipper	A	4	0.9	9	1.5	13	20	61
Hybelle	HM	7	1.3	8	1.8	15	73	83
Mission Belle	FM	17	3.3	26	2.9	43	34	44
Blocky Bell	EM	13	2.2	29	3.9	42	80	66
Lady Bell	HM	6	0.7	13	1.8	19	83	81
Keystone Resistant Giant 3	AC	2	0.4	1	0.2	3	7	70
Tasty	BUR	13	1.7	19	2.4	32	83	72
Four Corners	SS	4	0.7	1	0.1	5	72	94
ARGO	SS	12	2.6	21	4.1	33	37	53
PIP	A	5	0.8	9	1.9	14	40	74
Belle Star	HM	31	5.2	9	1.2	40	50	56
MA 79259	RO	9	1.8	11	1.9	20	43	68
Early Bellringer	EM	24	3.3	47	5.1	71	36	34
Yellow Belle	SS	24	1.8	52	3.4	76	61	45
Green Boy	AG	10	1.7	22	3.1	32	118	84
Crispy	BUR	18	3.1	42	7.5	60	61	50
Annabelle	HM	12	2.4	11	2.3	23	59	72
Ringer	JSS	5	0.6	6	0.7	11	122	92
Stokes Early	SS	23	2.5	61	6.6	84	86	51
Summer Sweet 860	AC	12	1.4	6	1.0	18	40	69
Emerald Giant	AC	0	0	1	0.2	1	30	97
Grand Rio 66	HM	3	0.3	5	0.9	8	37	82
Cadice	A	5	0.7	8	1.2	13	93	88
Sharina	A	2	0.4	5	0.5	7	39	85
Staddon's Select	HM	1	0.1	9	0.8	10	64	86
Midway	HM	9	1.5	12	2.8	21	69	77
Florida VR2	HM	13	1.6	4	0.8	17	31	65
Gold Crest	JSS	16	3.3	25	4.1	41	57	58
Butter Belle	SS	26	1.5	19	1.7	45	58	57
Green Belle	AC	11	1.9	21	3.9	32	59	65
Wonder Belle	TA	10	1.2	19	2.3	29	89	75
Bell Tower	NK	8	1.8	13	3.1	21	52	71
Gator Belle	PS	7	1.3	27	5.5	34	61	64

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WINTER SQUASH CULTIVAR PERFORMANCE OBSERVATION

William H. Shoemaker

Along with pumpkins and gourds, winter squash are usually found at any roadside stand in autumn. They stand out as a symbol of fall and so are often very popular with customers as the leaves begin to turn color and fall. As there are many types of winter squash, this evaluation is limited to a few only. These are the butternut, acorn, buttercup and sweet potato squashes. This evaluation considers the productivity and characteristics of many of the cultivars currently available.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: A single 50' row, unreplicated, plants 3' apart, rows 10' apart, guard rows.

Planting: Seeds were planted with a jab planter at 1/2" to 5/8" depth on June 17.

Fertility: N, P and K were applied commercially at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb PO4/A as 18-46-0
K at 125 lb K20/A as 0-0-62

No sidedressings were applied.

Weed Control: Amiben 2E at 2.0 lb aia, ppi, double disced.
Hand weeding where necessary.

Insect Control: Furadan 15G was applied at 1.0 lb/1500' of row at planting.
Mid to late season applications of Sevin 80W at 1.0 lb aia for cucumber beetle control or Pydrin at 0.15 lb aia for beetle and squash bug control.

Disease Control: No disease control was needed.

Irrigation: None was used.

Harvest: A once over harvest at vine death and fruit maturity.

Results and Discussion

See Table 1 for Harvest Data.

Though the plot was planted about a week later than desired, this year's plot performed well. Squash Mosaic Virus was not a problem, probably due to a much lower population of cucumber beetles. Squash bug populations seemed lower than normal as well. This evaluation was made much simpler for those reasons. The deep rooting habit of winter squash made it resistant to problems of drought that occurred in August. The only problems were due to germination rates that were low in a few cultivars. Overseeding was used but there was still a shortage of plants in several cultivars.

Seven butternut cultivars were submitted for evaluation this year. Zenith stood out as a winner in this year's evaluation. It was a good sized butternut with very good uniformity. It produced the largest number of marketable fruit and with its large size produced the greatest weight of any butternut. Ponca was also very good, being very uniform but averaging 1/2 lb less per fruit. Puritan was the same size as Zenith but not quite as productive. Still, it was also a very good looking fruit. The others all had serious shortcomings. Early Butternut had a poor stand. Its fruit were large and uniform but the plants had less competition. Waltham just wasn't productive. Butterbush and Butterboy were productive but fruit quality wasn't as high. There were problems with narrow necks and necks that crooked as much as a half-circle. They would not display as well as some of the others.

A squash submitted by Stokes this year was unique, the sweet potato squash. The cultivar name was Delicata. Fruit were generally 8" to 16" long cylindrical with a slightly rough outer surface. Skin was white with longitudinal dark green stripes. Flesh color was a dull yellow and texture was very fine, similar to a buttercup. It was productive enough and might be an attractive addition to a roadside stand display.

The buttercup cultivars submitted this year were a repeat of last year's entries. Differences in productivity were slight, with Perfection having a small edge on the competition. The greatest differences lay in appearance. Delica (not to be confused with Delicata, the sweet potato squash) and Sweet Mama, both from Takii, were larger fruit, averaging 4.2 and 4.0 lb apiece, respectively. Kindred was the next largest with a 3.3 lb average. These three also differ in shape, with rounded shoulders. The other cultivars have sharp, squared shoulders. Kindred is also bright red whereas all the others are a dark green, almost black. It's a toss-up deciding which is best. It depends on the grower's system and waste.

Eleven acorn squash cultivars were submitted this year. Several cultivars averaged more than two pounds apiece, including Royal Acorn, Royal Bush, Taybelle and Burpee's Early acorn. Royal Acorn and Early Acorn, along with Table Ace, were leading producers, each producing more than 4.0 lb of squash per foot of row. Unicorn was close behind at 3.6 lb per foot of row. Differences in appearance were slight except for Jersey Golden Acorn, which is a rich, golden orange.

Table 1. Winter Squash Harvest Data

Cultivar	Source	No. of Fruit	Total Wt. (lb)	Average Wt. (lb)	Lb/foot of row	Type
Delica	TA	60	250.0	4.2	5.0	B-cup
Sweet Mama	TA	60	240.9	4.0	4.8	B-cup
Kindred	SS	69	224.8	3.3	4.5	B-cup
Buttercup, Burgess Strain	HM	86	237.4	2.8	4.7	B-cup
Buttercup, Burgess Strain	BS	103	246.7	2.4	4.9	B-cup
Perfection	SS	96	286.0	3.0	5.7	B-cup
Ponco	HM	115	204.9	1.8	4.1	B-nut
Zenith	HO	128	294.9	2.3	5.9	B-nut
Puritan	A	100	229.3	2.3	4.6	B-nut
Waltham Butternut	BS	30	86.6	2.9	1.7	B-nut
Burpee's Butterbush	BUR	88	114.4	1.3	2.3	B-nut
Burpee's Butterboy	BUR	101	218.5	2.2	4.4	B-nut
Early Butternut	EM	8	21.8	2.7	0.4	B-nut
Table Queen Ebony	AC	83	149.8	1.8	3.0	Acorn
Unicorn	HM	125	180.1	1.4	3.6	Acorn
Table Ace	HM	149	243.6	1.6	4.9	Acorn
Table Queen	A	93	154.4	1.7	3.1	Acorn
Royal Acorn	SS	100	213.0	2.1	4.3	Acorn
Jersey Golden Acorn	AC	88	109.8	1.2	2.2	Acorn
Ebony Acorn	BS	87	162.7	1.9	3.3	Acorn
Burpee's Early Acorn	BUR	79	208.2	2.6	4.2	Acorn
Table King	HM	75	115.5	1.5	2.3	Acorn
Taybelle	A	62	146.1	2.4	2.9	Acorn
Royal Bush	A	15	31.6	2.1	0.6	Acorn
Delicata	SS	81	186.9	2.3	3.7	Sw. Pot.

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JACK O'LANTERN PUMPKIN CULTIVAR PERFORMANCE OBSERVATION

William H. Shoemaker

Many vegetable growers finish up their season with a bevy of full-season crops that constitute the Fall Harvest. Usually the pumpkin grown for Jack O'Lanterns is the centerpiece crop. The presence of these round, orange, bulbous fruits announce the arrival of autumn and provide a fresh draw of customers to the roadside stand. The importance of this crop creates a demand for pumpkin cultivars with dependability, uniformity and a distinct set of characteristics to satisfy the customer. This evaluation attempts to canvass the cultivars available to see how they compare with each other in a Northern Illinois field trial.

Materials and Methods

Location: St. Charles Horticulture Research Center, St. Charles, IL

Soil Type: Proctor Silt Loam

Plot Layout: One 50' row, unreplicated, plants 3' apart, rows 7.5' apart.

Planting: Planted on May 24 with a jab planter at 1/2" depth.

Fertility: Applications of N, P and K were made at the following rates:

N at 80 lb N/A as 40% 46-0-0 and 60% 18-46-0
P at 90 lb P04/A as 18-46-0
K at 125 lb K20/A as 0-0-62

A sidedressing of 25 lb N/A as NH4N03 was applied at 4 weeks.

Weed Control: Amiben 2E was applied at 4.0 lb aia, ppi, double disced. Hand cultivation was used as needed.

Insect Control: Furadan 15G overtop at 1.5 lb/1000' of row for early Cucumber Beetle control. Pydrin at 0.15 lb aia was applied with a high-pressure boom sprayer for Squash Bug and Cucumber Beetle control from fruit set on.

Disease Control: Good insect control for virus problems. Mancozeb and Benlate in a tank mix were applied for Black Rot control when needed.

Irrigation: None was used.

Harvest: A one-time full harvest after mildew took the vines down on 10/6.

Results and Discussion

See Table 1 for harvest data.

This year's plot performed well with good plant stands after thinning in all but a few cultivars. Cool temperatures in August seemed to delay maturity but this may have also allowed fruit to size up despite the lack of rainfall. Last year's plot was devastated by Squash Masaic Virus but this year the Cucumber Beetle populations were much lower so SqMV wasn't a problem. Squash Bug populations were also low. Furadan provided excellent early-season insect control which allowed the plot to be established properly.

Cultivars in this year's plot included any but the true pie pumpkins, such as 'Dickinson Field Pumpkin'. This provided quite a bit of diversity of shapes and sizes, from the large 'Connecticut Field' types to the small 'Spookie' types to the miniatures, such as 'Jack-Be-Little'. Of the large types 'Thomas Halloween' stood out by producing large numbers of big fruit. Its average weight per fruit was the highest of any cultivar while its number of fruit produced was among the highest of the large fruited types. The fruit of this cultivar tend to be elongated.

Though it averaged in the 10 lb range, 'Autumn Gold' stood out for several reasons. Its emergence rate was much higher than any other cultivar. It has a deep, rich dark orange color that was superior and was more uniform in size and shape than most cultivars.

A real disappointment emerged when it was discovered that the seed planted for the cultivar 'Spirit' was a different, inferior cultivar. This occasionally happens to research farms as well as growers and, particularly in this case, can be just as frustrating. 'Spirit' is a cultivar with loads of potential so it shouldn't be ignored because of its lack of presence in this year's evaluation.

'Spookie' was the most productive of the small pumpkins (2 to 6 lb). 'Baby Pam' from Agway was close behind in numbers of fruit produced and was a heavier fruit. An experimental from Harris/Moran Seed had very heavy duty plants and produced large, tough stems that took much abuse. 'HXP 2672' was also a good-looking, uniform fruit.

There were two miniature types in this years plot. These types are very heavily ribbed, flattened (about 1.5" from top to bottom) and about 3 to 4" across. They have become wildly popular in some areas and so deserve a good look. Of the two evaluated, 'Jack-Be-Little' from Abbott and Cobb was a much more productive cultivar. Both cultivars were of good quality with little real difference in appearance.

- Best large pumpkin cultivar for 1986: Thomas Halloween
  Best small pumpkin cultivar for 1986: Spookie
  Best miniature pumpkin cultivar for 1986: Jack-Be-Little

Table 1. Harvest Data

Cultivar	Source	No. of Fruit	Average Wt. (lb)	Comments
Sweetie Pie	SS	178	0.52	Unique shape, very fluted, good color
Howden Field	HM	39	15.30	Fair uniformity, good stems, nice size
Half Moon	AC	24	12.94	Fair stand, good stems, didn't color up well
Naked Seeded	SS	73	1.63	Poor stand, nice looking, seeds do not have a seed coat so easy to prepare for eating
Jack-Be-Little	AC	372	0.49	Similar to Sweetie Pie, very productive
Jackpot	HM	44	14.21	Good color, some stems weak
HXP 2677	HM	37	14.16	Excellent color, Excellent stem strength
Pankow's Field	HM	60	16.66	Nice stems, good color, not too uniform
HXP 3678	HM	76	11.58	Heavy duty crown and stems, nice color
Jack O'Lantern	BS	47	9.11	Light color, some weak stems
Spookie	HM	156	3.68	Nice color, good stems
Cinderella	BUR	32	12.46	Determinate plant (bushy), smooth skin very light color, almost yellow
Autumn Gold	JSS	80	9.87	Excellent plant stand, great emergence excellent color, good stems, smooth skin
HXP 2672	HM	116	3.31	Very heavy duty plants, excellent stems, smooth skin, very good stand
Young's Beauty	HO	85	10.57	Fruit not too uniform, good stems, good color
Connecticut Field	A	41	16.49	Many large pumpkins, good stems and color
Trick or Treat	AC	36	13.37	Good color, not too uniform
Funny Face	AC	58	11.17	Very stout plants, good color
Baby Pam	AG	136	4.97	Light colored stems, nice looking fruit
Triple Treat	BUR	42	4.15	Very nice color, light colored stems
Thomas Halloween	AG	82	18.49	Large, elongated fruit, good stems
Little Lantern	SS	88	2.53	Light colored stems, small pumpkins

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1986 VEGETABLE CULTIVAR TRIALS

Dixon Springs Agricultural Center

R. E. Call and J. W. Courter

Commercial vegetable growers can often increase their returns by planting new cultivars with increased insect and disease resistance, higher yields and improved quality. Some of these new cultivars are best adapted to the climates and soils of either northern or southern Illinois. This report gives the results of vegetable trials conducted in extreme southern Illinois.

Methods. The Dixon Springs Agricultural Center is located in Pope County. The Grantsburg silt loam soil tends to be droughty and irrigation is required for maximum yields and quality. The plots were irrigated with 1.0-1.5 inches of water every week of no rainfall. During the period of May 14-18, 7.92 inches of rain fell. Pesticide applications were made according to recommendations in University of Illinois Cooperative Extension Circulars 897, 907 and 1184.

Fertilizer applications were based on soil analyses taken in the fall prior to planting. The fertilizer rates used, weed control measures, plot spacings and planting dates were as follows:

MUSKMELON

Fertilizer: 475 pounds 12-12-12 per acre broadcast in the rows and incorporated prior to planting.

Weed control: Mechanical cultivation between the rows. Black plastic mulch in the row.

Field spacing: Rows spaced at 15 feet, plants at 2 feet; 3 plants per plot.

Planting date: Seeded 4/23/86; field set 5/29/86.

PEPPERS

Fertilizer: 300 pounds 12-12-12 per acre broadcast and incorporated prior to planting. Sidedressing of 50 pounds NH_4NO_3 applied 5/30/86.

Weed control: Treflan preplant incorporated 5/30/86 at a rate of one quart per acre. Mechanical cultivation.

Field spacing: Rows spaced at 6 feet; plants spaced at 2 feet; 5 plants per plot.

Planting date: Seeded 4/07/86; transplanted 4/22/86; field set 5/13/86.

PUMPKINS

Fertilizer: 475 pounds 12-12-12 per acre broadcast and incorporated prior to planting.

Weed control: Mechanical cultivation between rows.

Field spacing: Rows spaced at 15 feet; plots spaced at 4 feet; 3 plants per plot.

Planting date: Seeded 4/22/86; transplanted 5/29/86.

SWEET CORN

Fertilizer: 700 pounds 12-12-12 per acre broadcast and incorporated prior to planting. Two sidedressings of 100 pounds of actual N per acre applied 6/03/86 and 6/16/86 in the form of NH_4NO_3.

Weed control: All plots received 2 quarts AAtrex and 1 quart Dual pre-emergence per acre. Mechanical cultivation.

Field spacing: Rows spaced at 3 feet; plants spaced at 1 foot; 10 plants per plot.

Planting date: Planted 4/30/86 through 5/07/86.

TOMATOES

Fertilizer: 300 pounds 12-12-12 per acre broadcast and incorporated prior to planting. A sidedressing of 50 pounds of NH_4NO_3 was applied on 5/30/86.

Weed control: Treflan preplant incorporated at the rate of one quart per acre. Mechanical cultivation.

Field spacing: Rows spaced at 6 feet; plants spaced at 2 feet; 5 plants per plot.

Planting date: Seeded 4/10/86; transplanted 4/21/86; field set 5/13/86.

WATERMELONS

Fertilizer: 400 pounds 12-12-12 per acre broadcast and incorporated prior to planting.

Weed control: Black plastic mulch in the row. Mechanical cultivation between the rows.

Field spacing: Rows spaced at 15 feet; plants spaced at 3 feet; 5 plants per plot.

Planting date: Seeded 4/22/86; field set 5/29/86.

TABLE 1. U. S. WEATHER STATION RECORDS, 1986 GROWING SEASON
Dixon Springs Agricultural Center

Paul Quertermous

Week ending	Rainfall	Air Temperature[1] Maximum	Minimum	Week ending	Rainfall	Air Temperature[1] Maximum	Minimum
	(in)	(°F)	(°F)		(in)	(°F)	(°F)
APR 7	0.45	82	49	AUG 4	0.01	94	59
14	0.03	79	34	11	3.25	90	55
21	1.49	73	38	18	0.8	91	56
28	0.44	85	27	25	0.01	91	61
MAY 5	0.02	85	36	SEP 1	0.10	92	46
12	0.54	89	56	8	0.14	88	46
19	7.92	85	48	15	0.42	87	47
26	2.00	77	41	22	2.43	88	58
				29	1.34	91	68
JUN 2	0.59	88	55	OCT 6	1.78	90	52
9	2.42	90	59	13	0.37	76	35
16	0.10	90	55	20	0.00	77	33
23	0.00	93	56				
30	0.00	93	58				
JUL 7	0.44	95	60				
14	2.18	96	67				
21	0.87	96	68				
28	0.29	96	63				

[1]The maximum (single highest) and the minimum (single lowest) temperature recorded during the week.

	Table	
MUSKMELON	2	Earlidew, Performer, Star Performer, Allstar, Market Star, Summet, Super Star, Harper, Gold Star, Burpee Hybrid, Saticoy, Supermarket, Earligold, Nova, HXP 3006, Ambrosia, Explorer, Canada Gem
PEPPERS	3,4	Skipper, Cadice, Summer Sweet 860, Annabelle, Big Bertha, Lady Belle, Argo, Peto Wonder, 8339, Lamuyo, Yolo Wonder B, HMX 4660, HPX 3650, Golden Boy, Jalapa Hot
PUMPKIN	5	Jackpot, Howden, Spirit, HXP 3678, Funny Face, Connecticut Field, Jack-O-Lantern, Spookie, HXP 2677, Baby Pam
SWEET CORN		
su yellow	6	Sundance, Norsweet, Seneca RXY 7001, FMX 163, Seneca 258, Arrester
su white	7	Quick Silver, Chalice, Silver Queen, Seneca Paleface
su bicolor	7	Harmony, Honey-N-Frost, HPX 4369 B, XPH 2615 BC, Dandy, Carnival, Bi-Queen
se yellow	8	BUX 5158-1, Crusader, Great Taste, Miracle, XPH 2638, Silverado
se bicolor	9	XPH 3363 B
se white	9	XP 221, Snowbelle, HXP 3367 W, XPH 2581 W
sh_2 yellow	10	Summer Sweet 7200, Great Time, Illini Gold, Summer Sweet 7600, FMX 77, Zenith, Main Time, Ultimate, Summer Sweet 7700, Summer Sweet 7900, Sweetie
sh_2 white	11	Summer Sweet 8601
sh_2 bicolor	12	Ivory & Gold, SCH 5425, SP-008, Summer Sweet 7802, XPH 2608
sweet genes (yellow)	13	FMX 161, Honeycomb, FMX 23
TOMATOES		
Main Crop	14	President, HPX 5074, Jet Star, Summer Flavor 4000, Celebrity, NC 8230, NC 8322, NC 83133, HYB 724, Sunny, Pik Red, HXP 2795, Piedmont, Suncoast, Mt. Pride, NC 8288, Winner's Circle
Union County	15	HXP 2795, Pik Red
Cherry	16	Baxter's Early, Small Fry, Cherry Challenger, Large Red Cherry, Sweetie, Cherry Grande
Paste	17	Chunky, Macero II
Compact	18	Better Bush, Patio, Patio Prize
WATERMELONS	19	Seedless 313, Super Sweet Seedless, XPH 5081, Calsweet, Semiseedless Yellow, Royal Jubilee, Crimson Sweet, Yellow Baby, Rebel Queen

TABLE 2. MUSKMELON CULTIVAR TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days	Total market yield (no/A)	Melon size (lb)	Netting	Notes
Explorer	NK	61	25,652	3.8	Fine	Firm, round, early,
Ambrosia	BUR	61	22,264	4.1	Light	Soft, aromatic, oblong, standard, local sales
Performer	AC	63	21,780	3.4	Heavy	Firm, oblong, trial
Earlimark	HC	63	20,328	3.8	Light	Firm, round
HXP 3592	HM	56	20,328	5.9	Heavy	Medium firm, off flavor, fluted
Earlisweet	SS	57	17,908	3.7	Light	Soft, off flavor, round
Dixie Jumbo	B	61	16,940	4.9	Light	Medium firm, oblong
Allstar	HM	61	16,456	5.5	Medium	Medium firm, round, sweet, not musky, trial
Earlidew	SS	61	15,488	5.7	Smooth	Thin light green, sweet, trial
FMX 50	FM	61	15,488	5.1		
Magnum 45	PS	61	15,488	4.9	Heavy	Firm
Summet	A	61	14,520	4.7	Medium	Firm, round, standard
Nova	NK	61	14,036	5.9	Medium	Firm, sweet, trial
HXP 3006	HM	61	14,036	6.6	Medium	Medium firm, oblong, trial
PSX 6682	PS	61	14,036	4.3		Firm, not musky, oblong
Rocky Sweet	P	61	14,036	4.2	Very light	Soft, honeydew thin yellow, trial
Hiline	A	68	13,552	4.4	Heavy	Very firm, oblong, no flavor
Market Star	PS	61	13,552	4.8	Medium	Firm, round
Saticoy	SS	61	13,068	6.2	Light	Firm, round, standard
Earligold	HC	56	12,584	5.3	Smooth	Firm, sweet, oblong, trial early
FMX 40	FM	61	12,584	5.4	Light	Firm, not too sweet, bright orange flesh, dark green rind
Laguna	A	65	12,100	6.7	Medium	Firm, round, off flavor
Supermarket	PS	61	12,100	5.4	Medium	Firm, standard, oblong
Charmel	PS	56	11,616	3.9	Smooth	Soft, off flavor, round

(continued)

TABLE 2. MUSKMELON CULTIVAR TRIAL, 1986 (*continued*)

Cultivar	Source	Days	Total market yield (*no/A*)	Melon size (*lb*)	Netting	Notes
Sugar Salmon	SS	61	11,616	3.3	Light	Medium firm, sweet, oblong
Zenith	SU	61	11,616	6.9	Medium	Firm, off flavor, fluted
Perfection	SS	56	11,616	4.7	Light	Firm, not musky, round
Star Headliner	T	61	11,132	5.6	Light	Firm, off flavor
Star Performer	T	61	11,132	3.5	Medium	Firm, oblong, trial
Super Star	HM	56	11,132	7.3	Heavy	Firm, standard, oblong
Producer	AC	63	10,648	3.1	Heavy	Firm, round, trial
HXP 3592	HM	61	10,648	7.1	Medium	Medium firm, off flavor, oblong, fluted
Roadside	PS	57	10,648	6.9	Light	Firm, round, fluted
Harper Hybrid	SS	57	10,164	5.4	Light	Soft, round, standard for local sales
Columbia	NK	61	10,164	4.5	Medium	Firm, round, fluted, trial
Sunrise	AG	61	10,164	5.5	Light	Medium firm, oblong, trial
Gold Star	HM	61	10,164	6.2	Medium	Firm, oblong, fluted, standard
Classic	PS	59	9,680	5.8	Light	Firm, poor flavor
Burpee Hybrid	BUR	61	9,680	6.3	Medium	Firm, standard
PSR 10084	PS	57	9,680	8.0	Heavy	Soft, large round, fluted
PSX E 680	PS	61	9,196	6.5	Medium	Firm, oblong
Star Producer	T	61	9,196	4.0	Heavy	Firm, good flavor and aroma
Canada Gem	SS	56	8,228	7.0	Medium	Medium, sweet, round, trial
Conquistador	NK	61	7,260	6.7		
Musketeer	SS	56	6,776	4.2	Smooth	Firm, poor flavor, round
XP 673	AG	53	6,292	5.1	Medium	Very firm, round
Honeyloupe	SS	68	6,292	5.8	Smooth	Honeydew
Honeyshaw	B	68	5,324	15.3	Smooth	Soft, off flavor, honeydew
Charentais Imp	SS	65	5,324	4.4	Medium	Medium firm

Harvest: 7/25/86 - 9/12/86

TABLE 3. GREEN BELL PEPPER TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Early Yield[1] US 1 (lb)	Early Yield[1] Marketable (lb)	Early Yield[1] Avg fruit size (oz)	Total Yield[2] Marketable (lb)	Total Yield[2] US 1 (%)	Total Yield[2] Avg fruit size (oz)	Total Yield[2] Culls /plant (no)	Notes[3]
Skipper	A	3.3	4.4	5.0	7.7	52	5.3	2.0	3-4 lobed, blocky
Cadice	AG	2.4	4.4	5.3	9.7	40	4.0	5.6	Slender taper, 3-lobed
Summer Sweet 860	AC	3.1	4.3	6.0	8.6	43	4.6	1.8	Thick wall, 3-lobed, blocky, firm, nice, yellow when mature
Annabelle	HM	2.1	4.2	5.4	7.9	37	4.7	2.4	Standard, 3-lobed, blocky
Argo	SS	2.8	4.1	5.6	8.3	59	3.8	1.2	Long tapered, 3-lobed, nice
Better Belle	P	0.9	4.1	4.8	8.3	19	4.2	4.4	2-3 lobed, blocky
Peto Wonder	P	3.3	4.0	6.7	8.4	71	5.4	1.4	Elongated, 3-4 lobed, nice
Bell Tower	HM	3.1	4.0	7.4	9.3	45	4.4	0.8	Thick wall, 3-lobed, blocky, nice
Four Corners	FM	2.3	4.0	5.1	8.6	33	4.1	2.7	Blocky, 2-3 lobed
FMX 767	FM	1.4	4.0	4.8	8.5	20	3.9	2.2	Thick walls, variable shape
Blocky Bell	P	1.0	4.0	4.8	8.4	24	4.4	4.8	Rough
Lamuyo	RO	3.1	3.9	5.9	9.4	53	4.4	2.0	Large blocky taper, 3-lobed, uniform, trial
MA 79259	RO	2.3	3.8	5.3	5.7	53	4.8	2.6	Blocky, 4-lobed, thick walls
Big Bertha	P	2.2	3.8	5.8	7.8	54	4.6	4.4	Large, long tapered, nice
Tambell II	AR	1.2	3.7	4.9	7.6	21	4.2	5.6	Rough
Bell Captain	P	2.1	3.6	5.5	7.7	43	4.9	1.0	
P 324	NK	1.7	3.6	4.6	7.7	26	3.9	2.0	Yellow when mature
Lady Belle	HM	1.6	3.4	4.7	10.1	40	4.6	7.8	Standard, 3-4 lobed, blocky
8339	RCA	1.5	3.4	5.1	7.2	36	4.7	3.4	Large, tapered, trial
Ma Bell	P	0.3	3.4	4.8	9.1	14	4.1	4.4	Sunburned
P 327	NK	2.0	3.3	6.0	5.2	32	5.2	2.8	3-lobed, golden yellow when mature
Green Boy	AG	1.4	3.3	4.6	8.4	50	4.3	10.0	2-3 lobed, blocky
Bell Boy	P	1.6	3.2	4.7	6.3	50	3.4	5.4	
HMX 4660	HM	2.1	3.1	4.9	8.6	51	4.4	5.6	Variable size, trial

(continued)

TABLE 3. GREEN BELL PEPPER TRIAL, 1986 (*continued*)

Cultivar	Source	Early Yield[1] US 1 (lb)	Early Yield[1] Marketable (lb)	Early Yield[1] Avg fruit size (oz)	Total Yield[2] Marketable (lb)	Total Yield[2] US 1 (%)	Total Yield[2] Avg fruit size (oz)	Culls /plant (no)	Notes[3]
Grand Rio 66	HM	1.7	3.1	5.5	5.2	42	5.0	4.4	Thick walls, little rough
Yolo Wonder B	P	0.2	3.1	4.7	7.2	14	4.5	1.0	
FLA VR2	HM	0.7	3.0	4.5	5.5	15	3.7	3.0	Rough, 4-lobed, blocky, flat
Liberty Bell	AC	0.4	2.9	3.7	6.2	21	3.5	3.4	2-4 lobed, blocky
Stoke's Early	SS	0.0	2.9	3.1	5.9	7	2.3	15.8	Small, 3-lobed, thin walls
Klondike Bell	SS	1.9	2.8	5.6	5.0	52	4.6	3.2	Golden yellow when mature, blocky thick walls
Olympic	A	1.2	2.8	5.6	5.2	37	4.0	4.2	Golden yellow when mature, rough, 3-4 lobed, blocky
Early Canada Bell	SS	0.9	2.7	4.9	5.0	32	4.3	8.0	Pointed, firm
HXP 3650	HM	1.8	2.6	6.9	6.7	45	4.6	5.2	Large, elongated, blunt nose, variable, trial
Staddon's Select	SS	0.0	2.6	4.5	5.3	25	3.0	7.2	Rough
Canape	P	0.0	2.6	2.9	7.2	4	2.9	5.6	Pointed, thin walls
Early Niagra Giant	SS	1.3	2.5	4.8	6.8	26	3.9	1.2	
Mission Bell	FM	0.9	2.5	5.6	7.6	32	4.6	2.6	3-lobed, blocky
Belle Star	FM	0.9	2.5	4.3	9.7	33	3.9	1.8	3-4 lobed, blocky
Early Banquet	P	0.5	2.2	4.1	7.8	21	3.5	7.0	Thin walls, rough, pointed
Sweet Belle	FM	1.2	2.1	5.6	9.0	46	4.6	1.4	Thick walls, 2-3 lobed, blocky
ACX 868802	FM	0.9	2.0	4.3	6.7	42	4.0	1.0	
5734	RCA	0.0	2.0	3.6	3.5	3	3.3	5.6	Small blocky fruit, mixed types
Lincoln Bell	SS	0.0	1.9	4.3	4.2	7	4.1	17.8	
5727	RCA	0.6	1.7	4.1	4.6	13	2.9	10.8	Mixed type
5641	RCA	0.0	1.7	3.7	4.9	0	3.3	7.4	Small, sunburn
5639	RCA	0.0	1.5	3.6	2.5	0	3.2	7.6	Small, blocky, sunburn
5732	RCA	0.0	1.3	3.6	2.5	0	3.3	8.8	

[1]Early yield: 7/07/86 - 8/05/86
[2]Total yield: 7/07/86 - 9/23/86
[3]Red when mature unless otherwise noted

TABLE 4. YELLOW BELL, HOT AND FRYING PEPPER TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Early Yield[1] US 1 (lb)	Early Yield[1] Marketable (lb)	Early Yield[1] Avg fruit size (oz)	Total Yield[2] Marketable (lb)	Total Yield[2] US 1 (%)	Total Yield[2] Avg fruit size (oz)	Total Yield[2] Culls /plant (no)	Notes
YELLOW BELL									
Garden Sunshine	SU	2.0	4.7	4.5	9.2	32	4.0	4.2	RWM[3], some purple streaks, blocky, thick walls, attractive
Goldie	SS	0.0	2.9	3.4	6.6	0	3.0	2.8	RWM, sweet, firm, attractive, thick walled
Giant Szegedi	SS	0.6	2.9	2.7	8.7	20	2.6	5.8	RWM
Golden Boy	RS	1.5	2.3	4.5	5.6	46	3.8	6.8	Thick walled, 3-lobed, blocky
Super Stuff	SS	0.0	2.1	2.8	5.7	2	2.6	5.4	RWM, pointed
Yellow Belle	SS	0.0	2.0	2.6	6.8	0	2.0	4.6	RWM
Butter Finger (non-bell)	P	1.4	1.4	0.7	2.2	100	0.5	16.4	Sweet, yellow, pointed, cracks when mature
HOT									
FMX 879	FM	5.6	5.6	2.3	7.8	100	1.2	1.2	Light yellow-green, long tapered-pointed, very hot
Gold Spike	P	2.7	2.7	0.6	6.6	100	0.7	3.6	Small yellow, attractive
Szentesi Hot	SS	1.1	2.5	2.7	3.0	47	1.6	2.2	Greenish-yellow, RWM, pointed
Jalapa Hot	P	1.7	1.7	1.7	5.2	100	2.1	2.4	Jalapeno type, RWM, nice
FRYING									
FMX 714	FM	3.3	4.1	3.6	8.7	61	3.3	5.4	Attractive, green
Fry King	AG	3.8	3.8	2.3	8.5	100	2.3	3.6	Green
Gypsy	P	2.7	3.5	2.6	6.0	48	2.4	7.2	Light yellow-green, RWM, good set, home garden

[1]Early season - 7/07/86 to 8/05/86
[2]Total season - 7/07/86 to 9/23/86
[3]RWM = Red When Mature

All data on a per plant basis.

TABLE 5. PUMPKIN CULTIVAR TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Avg size (lb)	Dimensions Height (in)	Dimensions Width (in)	Yield Number /acre	Yield Tons /acre	Sidewall thickness (in)	Stem diameter (in)	Orange color rating
Big Mac	A	22.9	16.0	20.0	700	8.3	1.4	1.4	F
Jackpot	HM	13.3	11.5	9.1	1900	12.9	1.3	1.4	E
Howden	HM	12.3	10.3	10.5	1200	7.4	1.2	1.3	E
Spirit	B	11.3	9.2	8.5	3600	20.5	1.4	1.3	G
HXP 3678	HM	9.7	8.8	9.0	3800	18.8	1.0	1.5	E
Funny Face	PS	9.3	10.5	9.5	3000	14.0	1.3	1.4	E
Jack-O-Lantern	A	7.2	7.2	8.3	7200	26.1	1.4	0.8	G
Half Moon	PS	5.9	7.3	8.0	1200	3.6	1.1	1.0	F
HXP 2677	HM	4.0	6.0	6.3	5000	10.2	1.0	0.9	E
Spookie	HM	2.9	4.2	5.5	6200	9.1	0.9	1.3	G
Little Lantern	SS	2.4	3.8	5.3	3000	3.6	0.8	1.1	E
Baby Pam	AG	2.2	3.8	5.3	2900	3.2	0.8	0.8	E

All data on a per plant basis

Field set: 5/29/86

Harvested through: 10/02/86

Color rating: E = Excellent
G = Good
F = Fair

TABLE 6. YELLOW (su) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
Sundance	HM	68	7	8.0	7.5	9.0	2.3	10.0	Standard
Seneca Horizon	SS	69	5	9.0	7.9	9.5	2.6	7.0	Poor stand
Norsweet	SS	70	10	10.0	8.0	8.5	2.3	8.0	Loose husk, trial
Debut	R	71	1	8.0	7.5	8.5	2.2	9.0	Bird damage
Seneca RXP 391	RS	71	4	10.0	8.0	8.2	2.3	10.0	Bird damage
XPH 2591	A	71	4	10.0	8.0	8.0	2.1	10.0	Bird damage
80-2216	R	72	6	10.0	8.5	9.5	3.0	4.0	
HXP 2340 Y	HM	72	7	10.0	8.5	8.0	2.3	10.0	
Seneca RXY 6401	RS	72	8	9.5	8.0	8.2	2.3	9.0	
Rival	A	72	10	10.0	8.0	8.5	2.4	4.0	Poor kernel fill
83-1815	R	73	6	7.0	7.5	8.0	1.9		Smut, bird damage
Springdance	SS	73	7	7.0	9.0	8.5	2.4	9.0	Bird damage
Seneca RXY 6601	RS	73	4	9.5	7.8	8.0	2.0	10.0	Long shanks, bird damage
Seneca RXY 7001	RS	73	10	10.0	8.0	7.8	2.0	10.0	Tender
Norgold	SS	74	11	10.0	7.8	9.0	2.6	8.5	
Supreme	HM	74	3	9.0	6.8	8.5	2.3	9.0	Bird damage, poor stand
XPH 2572	A	76	13	9.0	7.5	8.0	1.9	10.0	Tight husk
AUX 2559	SS	76	8	10.0	8.5	8.2	2.5	9.0	Long shanks
81-2267	R	77	9	8.0	8.5	8.5	2.5	9.0	
82-2203	R	77	3	6.0	7.5	9.0	3.0	8.5	
FMX 163	FM	77	14	9.5	8.5	8.2	2.6	10.0	Long cylindrical ear, attractive
XPH 2618	A	77	2	7.5	7.0	8.0	2.0	8.5	Small kernels, bird damage
Seneca 258	RS	78	9	8.0	8.5	8.7	2.6	7.0	Tight husk, trial
Arrester	SU	79	11	10.0	8.0	9.0	2.9	9.5	Small kernels, large flag leaves, trial
Flavorvee	SS	79	13	7.5	8.6	8.3	2.5	8.0	
Napier	RS	79	10	6.0	9.0	9.0	3.1	9.0	Small kernels

[1]Days from planting on May 2, 1986; 10 seeds per plot
[2]Husk cover: 10 = complete, tight, 5 = unacceptable
[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 7. WHITE AND BICOLOR (su) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
WHITE									
Quick Silver	HM	72	12	9.0	7.0	8.5	2.2	9.0	Some blanking, standard
Chalice	R	75	8	9.0	8.0	8.5	2.5	10.0	Trial
81-2808	R	77	11	7.5	8.2	8.5	2.4	9.5	Long tapered ear
Silver Queen	R	78	10	8.0	8.1	8.4	2.5	9.5	Standard
Seneca Paleface	RS	79	10	7.5	8.1	7.7	2.1	9.5	
Silverado	HM	79	8	8.5	8.0	8.9	2.5	9.0	Trial
BICOLOR									
Early Gold & Silver	SS	67	0	6.0	8.6	7.7	1.8	9.0	Purple husk, severe bird damage
Harmony	HM	69	8	10.0	7.5	9.5	2.4	9.0	Bird damage, standard
HXP 4382	HM	70	0	6.0	9.0	9.0	2.8	10.0	Bird damage
Honey-N-Frost	SW	71	9	9.0	7.5	8.0	1.8	10.0	Bird damage, standard
Crystal-N-Gold	SW	74	3	9.0	8.5	9.0	3.1	9.5	Bird damage
81-2807	R	74	15	4.0	9.0	8.5	2.6	8.5	
HPX 4369 B	HM	75	10	10.0	6.5	8.0	1.6	9.0	Trial
XPH 2615 BC	A	75	7	10.0	8.0	8.4	2.4	10.0	Trial
Seneca RBX 8501	RS	77	11	5.5	8.5	8.7	2.5	9.5	
Dandy	A	78	8	9.0	7.1	8.0	2.0	9.0	Small ears, trial
Carnival	A	79	11	9.5	9.0	8.5	2.8	9.5	Lots of flag leaves, trial
Bi-Queen	R	79	6	7.0	8.0	8.3	2.3	8.5	Standard

[1]Days from planting on May 2, 1986, 1986; 10 seeds per plot
[2]Husk cover: 10 = complete, tight; 5 = unacceptable
[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 8. YELLOW HIGH SUGAR (se) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
Sweet Star	SS	61	7	6.5	7.8	8.5	2.5	9.0	Bird damage
84-93 EH	MU	68	11	6.3	8.5	9.0	2.8	7.3	
BUX 5158-1	HM	72	10	7.8	8.1	8.2	2.2	9.3	Tender, trial
EXP 84 H 233	SW	72	9	2.0	8.7	8.2	2.4	5.5	Tender
83-284 EH	MU	72	9	7.5	7.8	8.1	2.2	8.3	
84-2424	R	72	6	3.5	8.1	8.4	2.4	8.7	
83-435 EH	MU	72	13	7.7	8.4	8.2	2.4	8.7	
Crusader	SS	72	14	9.3	8.0	9.4	2.8	9.2	Large husk, trial
81-2572	R	73	14	4.3	8.9	8.6	2.7	9.0	
Great Taste	T	73	9	8.3	8.0	8.6	2.4	7.5	Trial
Miracle	SS	73	12	7.3	8.2	8.7	2.6	8.3	Tight husk, standard
84-2429	R	73	9	4.5	8.1	8.3	2.4	9.3	
84-1108 EH	MU	75	11	6.0	9.0	9.0	3.1	9.0	
AVX 2539	SU	76	10	5.5	8.5	8.9	2.9	7.5	
XPH 2638	A	76	12	9.2	8.5	8.8	2.8	7.3	
EXP 84 H 245	SW	77	11	5.7	8.9	9.2	3.3	7.7	Tight husk
84-2468	R	82	3	2.5	8.7	8.3	2.5	7.8	

[1]Days from planting: May 5, 1986; 10 seeds per plot; data are means of three replications

[2]Husk cover: 10 = complete, tight; 5 = unacceptable

[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 9. BICOLOR AND WHITE HIGH SUGAR (se) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
BICOLOR									
HXP 3363 B	HM	71	9	9.7	7.3	7.7	2.0	8.8	
EXP 84 H 63-BC	SW	81	12	3.0	8.3	7.9	2.1	6.0	
WHITE									
XPH 2617 W	A	73	5	9.3	7.9	7.7	2.1	9.0	Not sweet, tight husk, poor stand
XP 534	AG	74	8	7.0	8.1	7.8	2.2	9.7	
XP 221	AG	74	9	8.0	8.4	8.5	2.6	9.8	Trial
Snowbelle	A	74	11	8.2	7.9	8.4	2.4	9.0	Standard
HXP 3367 W	HM	74	8	8.3	8.0	8.8	2.5	8.5	Tender, trial
XPH 2581 W	A	77	6	8.5	8.5	8.4	2.7	9.8	Tender, trial, poor stand

[1]Days from planting: Bicolor, May 2, 1986; White, May 2, 1986; 10 seeds per plot; data are means of three replications

[2]Husk cover: 10 = complete, tight; 5 = unacceptable

[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 10. YELLOW HIGH SUGAR (sh_2) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
Northern Super Sweet	SS	63	0	6.0	8.5	9.0	2.9	9.0	Severe bird damage
Northern Xtra Sweet	I	64	0	7.0	8.4	9.3	3.1	9.0	Large kernels
SCH 4005	I	65	0	6.7	8.0	8.8	2.5	9.0	Bird damage
HMX 4370 S	HM	65	6	5.3	8.0	8.8	2.5	9.8	Large kernels
FMX 235	FM	65	0	4.0	8.9	9.1	3.1	8.8	Bird damage
Landmark	HM	65	0	5.8	8.7	8.5	3.2	8.8	Severe bird damage
Xtra Sweet 82	I	66	7	6.5	8.2	9.2	3.1	9.5	Loose husk
FMX 46	FM	67	7	6.0	8.5	8.9	3.0	9.8	
81-2945	R	67	10	7.0	8.8	8.9	3.2	9.0	
SCH 4009	I	68	9	6.0	8.2	8.8	2.7	8.5	
SCH 4006	I	68	11	5.7	8.5	8.8	2.9	9.2	Very sweet
81-2946	R	68	8	4.2	8.5	10.0	3.6	8.8	Large ears
SCH 5149	I	68	8	7.2	8.1	8.9	2.8	9.0	
SCH 4016	I	68	5	3.3	9.1	9.0	3.1	9.2	Creamy
FMX 76	FM	69	8	3.3	8.8	8.9	3.1	7.8	Big ear, blanking
FMX 81	FM	69	6	7.8	8.8	8.7	2.8	9.2	Very sweet
Pinnacle	HM	70	14	8.5	8.7	8.6	2.7	9.5	Not sweet
SCH 4041	I	70	13	7.3	9.2	8.7	2.9	8.5	Tight husk; lodging
Crisp "N" Sweet	HM	71	11	6.2	8.7	8.7	2.8	8.2	Lots of flag leaves
FMX 79	FM	71	8	4.8	8.8	8.9	2.8	8.8	
81-2949	R	71	11	9.3	8.0	9.0	2.7	10.0	Good looking
Summer Sweet 7200	AC	71	11	9.2	8.7	9.2	3.0	9.5	Tight husk, trial
Great Time	T	72	12	9.2	8.6	8.8	2.6	9.8	Tight husk, good looking, trial
Spring Sweet	SS	72	7	7.0	8.5	9.4	3.1	7.8	
SCH 5056	I	72	10	7.8	8.4	8.5	2.6	9.0	
SCH 4035	I	73	8	7.5	8.2	8.5	2.6	9.3	
SCH 4051	I	73	14	9.2	8.7	8.6	2.6	7.7	Lots of flag leaves, lodging

(continued)

TABLE 10. YELLOW HIGH SUGAR (sh_2) SWEET CORN CULTIVARS, 1986 (*continued*)

Cultivar	Source	Days[1]	Marketable ears (*no*)	Husk cover[2]	Husked ears[3] Length (*in*)	Dia. (*in*)	Wt. (*lb*)	Tip fill	Notes
Illini Gold	I	73	11	7.7	8.8	8.9	2.8	8.8	Very tender, sweet, trial
SCH 5059	I	74	10	7.3	8.8	8.7	2.8	7.5	Tight husk
Summer Sweet 7600	AC	74	11	10.0	7.5	8.2	2.1	9.0	Trial
Merlin Super Sweet	SS	74	9	4.8	8.6	8.3	2.4	8.8	Not sweet
FMX 77	FM	74	9	9.2	8.4	9.4	2.9	9.3	Trial
XPH 2605	A	74	13	9.2	9.1	9.3	3.3	6.8	Loose husk
XPH 2606	A	74	10	3.2	9.9	8.8	3.0	7.3	
SCH 5005	I	74	8	10.0	8.1	8.9	2.6	9.3	Tight husk
HMX 4372 S	H	74	8	6.7	9.1	9.4	3.2	8.8	Tender, sweet, large kernels
SCH 5049	I	74	13	8.2	8.1	8.7	2.7	7.0	Tight husk
SCH 5022	I	74	10	8.5	8.1	8.7	2.5	6.5	Loose husk
Zenith	H	75	11	8.8	8.1	8.6	2.7	9.8	Attractive, trial
Dinner-Time	T	75	9	7.8	9.3	8.6	2.7	6.8	Large ears and kernels
SCH 5041	I	75	11	9.0	8.6	8.7	2.7	9.5	
SCH 5092	I	75	10	6.8	8.6	8.8	2.7	7.0	Some blanking
Main-Time	T	76	14	9.8	7.6	8.9	2.5	9.3	Tight husk, small ear, trial
Sweet Belle	A	76	11	5.8	8.2	8.3	2.1	7.0	Some blanking
XPH 2656	A	76	12	7.5	9.0	8.5	2.7	6.8	
Sweet-Time	T	76	11	8.8	8.2	8.6	2.4	8.5	Tight husk, trial
SCH 5003	I	76	13	6.5	9.0	8.3	2.5	6.8	Some blanking
Summer Sweet 7700	AC	77	10	8.5	8.3	8.5	2.4	8.3	Tight husk, trial
Ultimate	HM	77	13	9.8	7.8	8.5	2.4	9.8	Small ear, tight husk, trial
Summer Sweet 7900	AC	78	10	7.5	8.0	8.3	2.3	9.3	Small ear, tight husk, trial
Sweetie	SU	78	9	7.2	7.5	9.0	2.6	9.2	Very sweet, attractive, trial
SCH 5004	I	79	7	8.7	8.5	8.5	2.5	9.5	Tight husk

[1]Days from planting on May 7, 1986; 10 seeds per plot; data are means of three replications
[2]Husk cover: 10 = complete, tight; 5 = unacceptable
[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 11. WHITE HIGH SUGAR (sh_2) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
FMX 244	FM	73	10	4.8	9.1	9.3	3.1	8.0	
How Sweet It Is	SS	74	7	4.2	7.9	8.7	2.4	9.3	AAS
Summer Sweet 8601	AC	75	8	5.4	8.0	8.8	2.4	8.0	Smut
XPH 2607	A	76	7	4.5	8.1	8.5	2.3	8.2	

[1]Days from planting on May 6, 1986; 10 seeds per plot; data are means of three replications

[2]Husk cover: 10 = complete, tight; 5 = unacceptable

[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 12. BICOLOR HIGH SUGAR (sh_2) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
Ivory & Gold	I	73	9	6.5	8.3	8.8	2.7	9.0	Trial
SCH 5430	I	73	8	6.3	8.5	8.9	2.9	9.5	
SCH 5425	I	74	17	9.5	8.0	9.3	2.8	10.0	Loose husk, trial
XP-008	AG	74	12	8.7	8.0	9.2	3.0	9.3	Very attractive, trial
Summer Sweet 7802	AC	74	11	9.2	8.1	9.3	2.8	10.0	Trial
SCH 4407	I	74	7	4.0	8.4	9.3	3.0	8.5	
SCH 4405	I	74	11	5.3	8.5	9.2	3.0	9.0	
HMX 4380-BS	HM	75	12	6.7	8.2	8.9	2.8	8.5	
Milk 'N Honey	SS	75	7	4.0	8.4	8.8	2.7	6.8	
XPH 2608	A	77	10	7.5	8.5	9.4	3.1	7.8	Very sweet, trial
Butterfruit	P	77	9	6.0	8.4	9.0	2.8	9.0	
Summer Sweet 8502	AC	78	12	5.8	8.1	8.9	2.6	8.5	Tight husk

[1]Days from planting on May 6, 1986; 10 seeds per plot; data are means of three replications

[2]Husk cover: 10 = complete, tight; 5 = unacceptable

[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 13. YELLOW HIGH SUGAR (sweet genes) SWEET CORN CULTIVARS, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Days[1]	Marketable ears (no)	Husk cover[2]	Husked ears[3] Length (in)	Dia. (in)	Wt. (lb)	Tip fill	Notes
FMX 46	FM	69	5	6.2	8.7	9.0	3.0	9.3	Bird damage
FMX 161	FM	73	9	8.5	8.3	8.5	2.6	10.0	Trial
Sugar Loaf	SU	75	10	7.6	7.8	8.9	2.6	7.8	
Honeycomb	SU	75	9	8.7	8.4	8.7	2.8	7.3	Standard
FMX 23	FM	76	12	8.0	8.9	8.9	2.9	9.3	Trial
81-2865	R	76	12	7.7	8.4	8.3	2.5	8.8	Not sweet, smut
AVX 2539	SU	78	10	4.8	8.9	9.0	3.0	7.3	

[1]Days from planting on May 5, 1986; 10 seeds per plot; data are means of three replications

[2]Husk cover: 10 = complete, tight; 5 = unacceptable

[3]Data for five husked ears; tip fill of 10 = complete fill

TABLE 14. TOMATO CULTIVAR TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Growth Habit[1]	Foliage[2]	Early Harvest: US 1 (lb)	Early Harvest: Total Marketable (lb)	Early Harvest: Avg Size US 1 (oz)	Total Harvest: Marketable (lb)	Total Harvest: US 1 (%)	Total Harvest: Avg Size (oz)	Total Harvest: Culls (no)	Total Harvest: Culls w/ Blossom End Rot (%)	Notes[3]
Starfire	SS	D	3	3.4	12.1	10.5	21.8	17	6.8	9.2	8	C, rough
Earlibright	SS	SD	2	0.9	11.6	4.5	18.2	5	3.5	13.8	0	
MOX 3015	HM	D	3+	4.6	10.2	2.7	18.0	26	3.5	5.6	56	Small
President	PS	D	4	4.1	9.4	10.9	24.5	32	7.3	3.4	2	Standard
Earlirouge	SS	D	3	1.4	9.0	7.5	17.7	8	4.3	14.2	0	R
Swift	SS	SD	2	0.8	8.3	4.9	13.0	6	3.6	19.6	0	
Jet Fire	SS	D	4	3.1	7.8	10.8	21.7	26	6.6	10.4	2	
Early Girl	B	I	4	0.5	7.7	5.7	24.7	2	4.2	11.4	0	Standard
XPH 5011	A	VD	4	3.0	7.5	14.1	26.9	28	8.2	3.2	6	R
E 431	NK	VD	4+	4.4	7.4	11.0	27.6	36	7.6	3.6	5	R
E 430	NK	VD	4	4.0	7.3	12.3	26.0	29	7.9	3.8	0	R
XPH 5074	A	VD	4	5.3	6.8	11.2	27.5	51	8.6	3.8	21	
Jet Star	HM	I	5	5.0	6.7	9.3	22.3	35	6.0	2.6	19	Standard
Summer Flavor 4000	AC	VD	4	3.0	6.7	14.1	20.0	36	8.2	5.4	39	Rough
XPH 5031	A	D	4	2.3	6.5	12.3	23.7	20	8.2	6.6	0	R
Burton	AR	I	5	4.0	6.3	11.9	25.2	47	7.5	4.2	5	
Lemon Boy	SS	I	5	1.0	5.8	11.4	27.8	14	5.6	7.4	12	R, C
Star Shot	SS	SD	2	0.2	5.8	5.3	13.4	5	3.8	12.6	2	
Celebrity	PS	VD	4+	3.2	5.8	10.2	27.6	34	7.0	3.0	17	Standard
FMX 79	FM	D	3	3.3	5.8	13.9	18.9	33	7.5	2.0	17	
HYB 724	A	D	3	3.0	5.8	11.4	21.8	19	6.4	3.2	33	R
NC 8230	NCS	D	5	3.4	5.7	10.5	25.0	35	6.0	5.4	13	Nice
Quintee	SS	D	4	1.2	5.5	6.9	23.4	10	4.5	10.2	2	Soft
Champion	B	I	4	1.2	5.4	8.7	17.3	20	5.4	11.8	19	R, C
Summer Flavor 2000	AC	SD	3	2.4	5.3	11.3	17.4	40	7.9	2.8	26	
Red Express	AG	D	4	1.7	5.2	11.3	21.6	26	7.3	6.0	14	R

(continued)

TABLE 14. TOMATO CULTIVAR TRIAL, 1986 (*continued*)

Cultivar	Source	Growth Habit[1]	Foliage[2]	Early Harvest US 1 (lb)	Early Harvest Total Marketable (lb)	Early Harvest Avg Size US 1 (oz)	Total Harvest Marketable (lb)	Total Harvest US 1 (%)	Total Harvest Avg Size (oz)	Total Harvest Culls (no)	Culls w/ Blossom End Rot (%)	Notes[3]
Pirate	NK	VD	5	3.0	5.2	10.0	30.5	30	6.8	5.6	7	R
Basketvee	SS	SD	4	2.5	5.2	10.0	24.7	37	6.4	8.0	11	
Viva	HM	D	4	3.0	5.2	10.0	20.7	24	7.2	2.2	15	R
Castle 1035	AR	D	4	2.0	5.1	10.0	26.4	20	7.2	3.0	35	R, C
Sango	RS	SD	4	2.5	5.1	11.1	20.7	29	5.4	9.8	0	
Horizon	U FL	SD	3+	1.8	5.0	9.6	19.1	28	7.2	5.0	0	
Taylor	AR	I	4	3.4	4.9	9.7	26.0	43	6.6	2.2	0	
Monterey	SU	VD	4+	2.1	4.8	9.3	27.7	26	6.8	3.8	0	
NC 8322	NCS	SD	4	2.2	4.7	9.3	29.0	28	6.8	5.4	4	Nice
Ultra Girl	SS	I	5	1.6	4.6	10.7	19.0	21	5.7	4.8	67	C
NC 83133	NCS	D	4	2.5	4.5	11.1	24.5	34	6.3	2.6	24	Trial
Better Boy	B	I	5	1.3	4.4	11.6	23.3	21	6.4	2.4	29	C
Superior	AR	D	4	0.7	4.3	7.0	23.4	9	4.3	7.6	31	R, C
Sunny	A	D	5	2.7	4.3	9.4	27.2	35	6.4	5.4	0	Standard
Pik Red	PM	SD	3	2.0	4.2	11.4	21.1	26	7.2	3.0	17	R, C, Standard
Cavalier	PS	VD	5	1.8	4.2	11.1	15.4	54	5.9	7.6	68	
HXP 2795	HM	D	4	2.9	4.2	12.9	28.2	50	9.2	2.4	20	Very nice
Hayslip	T	D	3	1.8	4.2	10.3	17.8	17	6.0	3.4	0	
Stokes Pik	SS	D	3	2.5	4.2	10.0	16.9	26	6.1	4.6	34	
Vegas	FM	SD	4	2.0	4.2	14.5	23.4	41	8.1	3.2	45	Rough
Pole King	T	I	5	2.4	4.2	12.8	21.6	46	8.4	3.0	21	
Piedmont	NCS	D	5	2.4	4.1	13.7	23.0	31	5.4	8.2	9	Nice
Castle King	AR	D	4	2.6	4.1	9.5	16.6	27	6.2	5.8	62	
HXP 4809	HM	SD	3	2.3	4.1	14.2	19.1	21	7.5	3.0	6	R
Ultra Boy	FM	I	5	1.3	3.9	11.6	19.6	24	6.6	7.2	53	R
HXP 2807	HM	VD	5	1.5	3.7	10.0	26.8	43	6.8	3.8	5	

(*continued*)

TABLE 14. TOMATO CULTIVAR TRIAL, 1986 (*continued*)

Cultivar	Source	Growth Habit[1]	Foliage[2]	Early Harvest US 1 (lb)	Early Harvest Total Marketable (lb)	Early Harvest Avg Size US 1 (oz)	Total Harvest Marketable (lb)	Total Harvest US 1 (%)	Total Harvest Avg Size (oz)	Total Harvest Culls (no)	Total Harvest Culls w/ Blossom End Rot (%)	Notes[3]
Bingo	FM	SD	3+	2.6	3.7	16.0	22.1	27	8.5	3.0	0	
FLA 1131	U FL	D	3	1.4	3.7	11.2	20.6	16	7.6	7.2	0	Deep R
Heartland	B	I	4+	2.0	3.5	12.3	18.2	43	7.5	2.4	29	
Roadside Red	AG	I	5	1.2	3.5	8.0	24.5	16	5.5	4.8	23	
Suncoast	U FL	SD	4	2.3	3.4	12.3	22.1	64	9.4	3.8	14	Trial
Mistic	SU	D	4	1.1	3.3	8.0	21.1	23	5.8	2.0	0	
AUX 2379	SU	D	4	0.8	3.2	9.1	24.1	22	6.9	4.6	49	R, C
Castle Crown	AR	D	4	1.5	3.2	8.6	20.2	12	6.1	3.4	56	
Harvestvee	SS	SD	3	1.5	3.2	8.0	18.2	22	5.6	3.4	37	
Valerie	HM	SD	3	1.1	3.1	8.0	19.4	21	5.8	5.8	0	
Mt. Pride	A	VD	5	1.2	3.1	9.6	23.4	39	6.4	6.8	0	Standard
NC 84100	NCS	D	5	1.0	2.9	11.4	22.0	27	5.7	2.0	38	
Reno	FM	VD	4	0.7	2.7	14.0	21.0	42	8.0	6.8	3	Trial
PSX M 74180	PS	SD	3+	1.5	2.6	8.0	15.2	16	5.5	2.8	7	R
Hermitage	SU	VD	4	0.9	2.5	10.3	22.1	4	6.8	1.8	4	Soft
Duchess	PS	D	4	0.6	2.5	9.6	10.9	18	5.6	6.4	83	
NC 8354	NCS	D	5	0.8	2.5	9.1	21.8	33	6.5	3.6	5	
NC 8288	NCS	D	4	0.6	2.4	8.0	24.9	38	7.1	2.0	0	Trial
Bunnyvee	SS	D	5	0.5	2.3	8.0	18.4	5	4.4	7.4	31	
Allstar	T	D	4	0.6	2.1	8.0	23.9	19	5.5	6.0	6	C
Winner's Circle	FM	D	3	0.8	1.3	13.6	24.2	38	8.4	3.2	16	Trial

[1] D = Determinant
SD = Strong Determinant
VD = Vigorous Determinant
I = Indeterminant

[2] 5 = Excellent
1 = Poor, sunburn

[3] R = Radial cracking
C = Concentric cracking

Early harvest = 7/07/86 - 7/24/86
Total harvest = 7/07/86 - 8/28/86

TABLE 15. UNION COUNTY TOMATO TRIAL, 1986
Cerney Farm, Cobden, Illinois
J. W. Courter, Rob Call and Kevin Kirby

Cultivar	Source	Growth habit	Early yield[1] U.S. No. 1 (lb)	Early yield[1] Total Mkt (lb)	Early yield[1] Avg Size No. 1 (oz)	Total yield[2] Mkt (lb)	Total yield[2] No. 1 (%)	Total yield[2] Avg Size (oz)	Culls/ plant (no)	Culls w/ blossom end rot (%)	Notes
HXP 2795	HM	D	5.5	7.4	9.5	9.6	64	8.5	13	91	Firm
Castlehy 1035	AR	D	4.7	6.2	8.2	11.3	57	8.0	12	62	Rough
Fla. 7131	UF	D	4.0	5.2	11.2	9.4	62	8.0	13	72	
Pik Red	HM	D	3.9	4.8	9.2	12.9	56	9.4	7	29	Standard
Castle Crown	AR	D	3.6	4.4	9.4	5.6	70	9.4	21	88	Firm, deep globe
NC 8322	NCS	D	3.5	4.7	9.3	14.8	57	8.8	9	74	Firm, not ripen uniformly
AVX 2379	SU	D	3.5	3.9	10.2	9.6	59	9.5	14	79	Flat shape, radial cracks
NC 83133	NCS	D	2.8	3.2	7.9	9.3	68	8.0	13	91	
NC 84100	NCS	D	2.2	2.8	7.8	10.5	63	8.2	10	72	Firm
HXP 4809	HM	D	2.1	3.0	9.3	12.0	56	9.4	6	50	Firm
MOX 3075	HM	D	---	4.2	3.1	----	--	--	17	66	Small
AVX 8680	SU	D	---	2.9	3.5	----	--	--	34	94	Small

[1]Early yield: 7/09/86 to 7/19/86
[2]Total yield: 7/09/86 to 8/01/86

Seeded: 3/26/86 Transplanted: 4/17/86
Planted: 5/02/86

Yields: pounds per plant
Culture: plants staked

TABLE 16. CHERRY TOMATO TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Marketable yield/plt (lb)	Avg size (oz)	Culls /plant (no)	Notes
AVX 7093	SU	34.7	0.75	1.8	
Baxter's Early	PS	19.6	0.55	0.0	Very attractive, firm, trial
Small Fry	SS	17.4	0.60	0.0	Firm, very small
Cherry Challenger	AC	14.8	0.77	0.0	Attractive, tough skin, trial
HXP 4817	HM	14.8	0.55	0.8	
NC 8642	NCS	13.5	0.54	3.2	
AVX 7094	SU	11.6	0.94	1.2	
Castlelette	AR	10.5	0.71	0.6	Firm
Red Cherry-Large	B	8.6	0.78	1.2	Standard
Cherry Sweet	NK	6.7	0.95	0.0	Sweet, cracks when ripe
Castlehy 1048	AR	5.8	1.00	0.4	Not uniform
Cherry Grande	PS	5.6	1.11	0.0	Trial
Sweetie	PS	5.3	0.20	0.0	Very small, very sweet
Gardener's Delight	JSS	4.5	0.47	12.2	Standard
Large Red Cherry	SU	3.5	0.73	1.4	Attractive
Whippersnapper	JSS	3.1	0.49	5.6	Pink fruit
Cherry Gold	SS	2.6	0.32	23.2	Cracking
Sweet 100	SS	2.4	0.34	3.4	Standard
Cherrio	JSS	2.1	0.63	8.4	Cracks
Small Red Cherry	B	2.0	0.25	4.8	Soft
Cherry Supreme	AR	1.9	0.93	0.6	Some cracking
Tiny Tim	SS	1.5	0.49	21.6	
Sweet Cherry	B	1.3	0.78	3.6	Cracking
Early Cherry Dwarf Bush	AG	0.8	0.64	8.0	

Harvested: 7/09 through 8/08 - three pickings. (These plants would yield 3-4 times as much if picked the entire season.)

TABLE 17. PASTE TOMATO TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Marketable wt/plant (lb)	Avg size (oz)	Culls /plant (no)	Culls w/ Blossom End Rot (%)	Notes
Chunky	SU	44.3	3.2	4.8	0	Nice
XPH 5308	A	24.7	4.1	11.8	35	
XPH 5210	A	24.0	2.9	5.6	62	
Macero II	HM	22.1	3.5	3.8	59	Long, tapered, very nice
XPH 5101	A	19.8	2.4	9.8	62	
Nova	SS	19.5	2.2	3.0	63	
Del Oro	HM	18.3	2.5	5.2	26	
Ranch	SU	18.2	3.0	3.2	20	
Vee Pick	SS	16.8	3.9	2.2	52	
Veeroma	SS	14.7	2.9	6.4	76	
Moira	SS	14.6	3.9	5.8	0	Boxy shape
Bellestar	SS	13.3	3.6	3.8	24	
Square Paste	SS	11.8	2.8	3.8	39	Tough skin
AVX 8680	SU	11.7	3.0	6.0	53	Uniform
XPH 5300	A	9.2	2.4	6.8	0	

Harvested: 7/17 - 8/18/86 -- four pickings

TABLE 18. COMPACT TOMATO TRIAL FOR HOME PLANTING, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Foliage[1]	Yield /plant (lb)	Avg size (oz)	Culls /plant (no)	Notes
Bush Beefsteak	SS	2	11.8	5.7	13.4	
Better Bush	P	3+	9.8	6.3	4.6	Potato leaf, large plant
Patio	SS	2	9.2	3.4	7.2	
Manitoba	SS	2	8.2	4.0	20.0	
Patio Prize	SS	3	8.0	6.2	6.8	
Florida Basket	SS	1	1.5	0.8	21.8	
SubArtic Max	SS	1	5.9	2.5	36.8	Some cracking
Dwarf Champion	SS	2	4.3	4.8	5.8	Potato leaf, large plant, pink fruit
Pixie Hyb II	BUR	1	3.7	2.0	20.8	
Florida Petite	SS	1	(Very poor; no yield)			Very dwarf

[1]1 = Poor
5 = Excellent

Harvested: 7/09 - 8/25/86

TABLE 19. WATERMELON CULTIVAR TRIAL, 1986
Dixon Springs Agricultural Center

Cultivar	Source	Melon /plant (no)	Avg size (lb)	Yield[1] /acre (no)	Notes
Seedless Hybrid 313	HM	5.0	16.6	4,840	Light green, striped, oblong
Super Sweet Seedless	ASW	4.7	18.1	4,550	Light green, striped, round-oblong
PS 19981	PS	4.3	18.4	4,163	Green, oblong
XPH 5081	A	4.3	12.0	4,162	Dark green, small round, trial
XPH 5078	A	4.0	17.4	3,872	Dark green, oblong
Huck Finn	FM	3.7	25.8	3,582	Dark green, striped, oblong
Calsweet	HC	3.7	22.6	3,582	Dark green, striped, oblong, trial
Royal Sweet	AC	3.7	21.1	3,582	Dark green, striped, oblong
Sundance (XPH 957)	A	3.7	20.5	3,582	Dark green, oblong, poor pollination
Semiseedless Yellow	ASW	3.7	10.6	3,582	Light green, round, best flavored yellow
Royal Jubilee	PS	3.3	25.9	3,194	Light green, striped, oblong
Royal Sweet	PS	3.3	23.7	3,194	Dark green, striped, oblong
Crimson Sweet	PS	3.3	22.6	3,194	Standard, light green, striped, round
Charleston 76	HM	3.3	22.2	3,194	Dark green, striped, oblong
MOX 1568	HM	3.3	20.4	3,194	Small round, soft
AVX 5501	SU	3.3	19.2	3,194	Dark green, round, very sweet
Tri-X 313-A (seedless)	ASW	3.3	15.8	3,194	Light green, striped, round
Yellow Baby	SS	3.3	9.2	3,194	Light green, striped, small, round, early
Charlie I	AC	3.0	29.4	2,904	Green, striped, oblong, watery flavor, marginal firmness
Sugarama	NK	3.0	23.9	2,904	Light green, striped, round
Royal Charleston	B	3.0	22.1	2,904	Light green, large oblong
Canada Super Sweet	SS	3.0	14.7	2,904	Light green, striped, oblong, large seeds, deep red flesh
Southern Belle	FM	3.0	10.9	2,904	Dark green, small round, not sweet
Tri-X 313-J (seedless)	ASW	2.8	17.0	2,710	Light green, striped, round
AVX 5500	SU	2.7	27.9	2,614	Light green, striped, oblong

(continued)

TABLE 19. WATERMELON CULTIVAR TRIAL, 1986 (*continued*)

Cultivar	Source	Melon /plant (*no*)	Avg size (*lb*)	Yield[1] /acre (*no*)	Notes
Royal Crimson	AC	2.7	26.0	2,614	Dark green, striped, oblong, deep red flesh
Rebel Queen	FM	2.7	21.5	2,614	Dark green, black stripes, oblong
Baronet (XPH 962)	A	2.7	21.3	2,614	Dark green, oblong, large seeds
Stokes Sugar	SS	2.7	16.4	2,614	Green, striped, oblong, off flavor, pink flesh
Expt 1 1019	ASW	2.7	17.0	2,614	Light green, striped, oblong, small seeds
All Sweet	SS	2.3	26.6	2,226	Light green, oblong, small seeds
Sweet Charlie	NK	2.3	20.1	2,226	Round, dull taste, light red flesh
Au-Jubilant	HC	2.0	27.9	1,936	Light green, striped, oblong, not too sweet
NVH 4258	NK	2.0	23.0	1,936	Light green, oblong
Garden Baby	B	2.0	12.7	1,936	Dark green, small round, soft, little flavor
Royal Windsor	T	1.7	26.8	1,646	Light green, striped, oblong, poor flavor, soft
Au-Producer	HC	1.7	25.7	1,646	Green striped, round
Oasis	HM	1.7	24.1	1,646	Light green, striped, oblong
Dixie Queen	B	1.7	16.6	1,646	Light green, striped, round
BUX 6030-1 (bush)	BUR	1.7	11.9	1,646	Dark green, round, deep red flesh

[1]Harvest period: July 25, 1986 to September 2, 1986

Seeded: 4/22/86
Transplanted: 5/28/86

SOURCES OF VEGETABLE VARIETIES

We gratefully acknowledge the following companies, universities and individuals for seed used in our trials. Inclusion or exclusion of companies in this list does not constitute a recommendation. Not all of these companies sell seeds directly to commercial growers.

A Asgrow Seed Co., Kalamazoo, MI 49001
AAS All America Selections, Box 344, Sycamore, IL 60178
AC Abbott & Cobb, Box 307, Feasterville, PA 19047
AG Agway, Inc., Box 1333, Syracuse, NY 13201
AM Asmer Seeds, Ltd., Asmer House, Ash Str., Leicester, England LE5000
AR Arco Seed Co., Box 181, El Centro, CA 92244
AS Agri Seed, 850 Dryden Road, Metamora, MI 48455
ASW American Seedless Watermelon Seed Corp., Goshen, IN 46526

B Ball Seed Company, Box 335, West Chicago, IL 60185
BE Bejo Zeden BU, P. O. Box 9, Dorpsstraat 612, 1722ZG, Noordscharwoude, Holland
BPS Burgess Plant & Seed Co., Box 218, Galesburg, MI 49053
BS Burrell Seed Growers Co., 405 N. Main, Rocky Ford, CO 81067
BUR W. Atlee Burpee Co., 615 N. 2nd Street, Clinton, IA 52732

C A. L. Castle, Inc., Box 877, Morgan Hill, CA 95037
CF Comstock Ferre & Co., Box 181, Wethersfield, CT 06109
CR Crookham Co., P. O. Box 520, Caldwell, ID 83605

DA Daehnfeldt, P. O. Box 947, albany, OR 97321
DE De Giorgi Co., Inc., Council Bluffs, IA 51501

EM Earl E. May Seed & Nursery Co., Shenandoah, IA 51603

FM Ferry-Morse Co., Box 100, Mountain View, CA 94040
FMC FMC Corp., ACD, Western Res. Center, Box 2508, El Macero, CA 95618
FR Fredonia Seeds, Fredonia, NY 14063
FS Farmer Seed & Nursery Co., Fairbault, MN 55021

G Glecker's Seedman, Metamora, OH 43540
GER Germania Seed Co., 5952 N. Milwaukee Ave., Chicago, IL 60646
GS Goldsmith Seed Co., Box 1349, Gilroy, CA 95020
GUR Gurney Seed & Nursery Co., 2nd & Capitol, Yankton, SD 57078

HA H. G. Hastings Co., Box 4088, Atlanta, GA 30302
HC Hollar and Company, Inc., P. O. Box 106, Rocky Ford, CO 81067
HE Herbst Bros. Seedsmen, Inc., 1000 N. Main, Brewster, NY 10509
HF Henry Field Seed & Nursery Co., 407 Sycamore, Shenendoah, IA 51602
HM Harris-Moran, 3670 Buffalo Road, Rochester, NY 14624
HO R. L. Holmes Seed Co., 2125 46th Street, N.W., Canton, OH 44709
HU A. H. Hummert Seed Co., 2746 Chouteau Avenue, St. Louis, MO 63103
HZ The H. G. Heinz Co., Dr. Davy Emmatty, 13737 Middleton Pike, Bowling Green, OH 43402

I Illinois Foundation Seeds, R. R. 1, Tolono, IL 61880

J J. R. Jung's Seed Co., Randolph, WI 53956
JSS Johnny's Selected Seeds, Albion, ME 04910

KYS Know-You-Seed Co., 26 Chung Cheng 2nd Road, Kaohsiung, Taiwan

L Liberty Seed Co., Box 806, New Philadelphia, OH 44663
LS Letherman's Inc., 1221 E. Tuscarawau Street, Canton, OH 44707

MR Martin Rispens & Sons, Box 5, 3332 Ridge Road, Lansing, IL 60438
MS Michigan State University, East Lansing, MI 48823
MU Musser Seed Co., 1403 Chicago, Box 787, Caldwell, ID 83605

NCS North Carolina State University, Raleigh, NC 27650
NI Nickerson Zwann BV, Postbus 19, 2990AA, Barendrecht, Holland
NK Northrup King & Co., 1500 Jackson Street, NE, Minneapolis, MN 55413
NS Niagra Seed, FMC Corp., Seed Dept., Box 3091, Modesto, CA 95353

OE Ohlseus Enke, Roskildevej 325A, DK-3620, Taastrup, Denmark
OK Oklahoma State University, Norman, OK 73069
OS L. O. Olds Seed Co., Box 1069, Madison, WI 53701

P George W. Park Seed Co., Greenwood, SC 29647
PS Petoseed Co., R. R. 4, Box 1255, Woodland, CA 95695

R Rogers Bros. Seed Co., Box 1647, Idaho Falls, ID 83401
RCA Ridgetown College of Agriculture & Techology, Ridgetown, Ontario, Canada
RO Royal Sluis, 1293 Harkins Road, Salinas, CA 93901
RS Robson Seed Farms Corp., 1 Seneca Circle, Hall, NY 14463

SA Sakata & Co., 120 Montgomery Street, San Francisco, CA 94104
SG Sluis & Groot of America, Inc., 124-A Griffen St., Salinas, CA 93901
SI Siegers Seed Co., 7245 Imlay City Road, Imlay City, MI 48444
SS Stokes Seeds, Inc., Box 548, Buffalo, NY 14240
ST Standard Seed Co., 931 W. 8th Street, Kansas City, MO 64106
SU Sun Seeds, Inc., 9301 Bryant Ave., S., Bloomington, MN 55420
SW Seedway, Inc., Hall, NY 14463

T Otis S. Twilley, Box 65, Trevose, PA 19047
TA Takii Seed Co., 301 Natividad Road, Salinas, CA 93906

UA University of Arkansas, Fayetteville, AR 72701
UFL University of Florida, Bradenton, FL 33505
UMO University of Missouri, Columbia, MO 65201

VJ Vaughn-Jacklin Corp., 5300 Katrine Avenue, Downers Grove, IL 60515
VBS Vermont Bean Seed Co., Garden Lane, Bomoseen, VT 05732
VE Vesey's Seed Co., York Prince, Edward Island, Canada

WL Wayne Lough, Box 411, DeForest, WI 53532
WM Willhite Melon Seed Farms, Box 23, Poolville, TX 76076