

Keeping PA Vegetable Growers Profitable: Statewide Cultivar Trials

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To provide growers with information for successful, region specific cultivar selection, in 2012, we evaluated 25 cultivars of bicolor and white synergistic sweet corn grown in a conventional system across the state. Evaluations were located in southwestern Pennsylvania at Bebout Farms in Venetia, in central Pennsylvania at the Russell E. Larson Research and Education Center in Rock Springs, and in southeastern Pennsylvania at the Southeast Research and Extension Center in Landisville.

The cultivars evaluated along with the company from which seed were acquired from are listed below. The standard used was 'Temptation'.

Synergistic Sweet Corn Varieties for Statewide Trial in 2012

<u>Cultivar</u>	<u>Seed Company</u>
Bicolor – total 18	
Allure	Rupp Seeds, Wauseon, OH
BC 0805	SeedWay, Elizabethtown, PA
Bicolor 1102	Seminis Vegetable Seeds, Oxnard, CA
Cuppa Joe	Rupp Seeds
Espresso	Rupp Seeds
Jackie	Harris Moran Seed Co., Modesto, CA
Ka-Ching	SeedWay
Kristine	Seigers/Crookham Seed Co., Holland, MI
Montauk	Harris Moran Seed Co.
Primus	SeedWay
Paydirt	SeedWay
Profit	SeedWay
Providence	SeedWay
1273	Seigers Seed Co.
1274	Seigers Seed Co.
Synergy	Seigers Seed Co.
Temptation*	Seigers Seed Co.
Temptation II	Seminis Vegetable Seeds

White – total 7

Avalon	SeedWay
Captivate	Rupp Seeds

Edelweiss	Harris Moran Seed Co.
Illusion	Rupp Seeds
Mattapoisett	SeedWay
Silver Duchess	Seigers Seed Co.
Whiteout	SeedWay

*se heterozygous (standard)

At all locations sweet corn was direct seeded with 8-10 inches between plants in a row and 30 inches between rows. Planting took place on 6 June in southwestern Pennsylvania, 1 June 2012 in central Pennsylvania, and 21 May in southeastern Pennsylvania.

At the southwestern site, 144.5 lb/acre N, 117 lb/acre P and 87 lb/acre K were applied as follows: 57 lb N, 57 lb P and 57 lb K per acre were broadcast preplant, 30 lb N, 60 lb P and 30 lb K per acre were banded at planting and 57.5 lb/acre N was sidedressed. Plants were irrigated twice during the season during periods of limited rainfall. Weeds were managed with pre-emergent herbicides: 1 Q atrazine (atrazine; Syngenta Crop Protection LLC, Wilmington, DE) and 1.5 Qt Dual II Magnum (metolachlor; Syngenta Crop Protection LLC, Wilmington, DE) per acre. Insects were managed with four applications of 1.5 pt/acre Lannate LV (methomyl; DuPont Crop Protection, Wilmington, DE) plus 1.5 oz/acre Warrior II (lambda-cyhalothrin; Syngenta Crop Protection LLC, Wilmington, DE).

At the central site, 50 lb/acre N and 45 lb/acre phosphate were broadcast preplant. Based on soil levels, K was not added. Weeds were managed with a preplant application of 3 oz/acre Callisto (mesotrione; Syngenta Crop Protection LLC, Wilmington, DE) and 1.5 pt/acre Bicep II Magnum (atrazine and metolachlor; Syngenta Crop Protection LLC, Wilmington, DE). Insect pests and diseases were left unmanaged. Supplemental water was provided through a drip irrigation (T-Tape model 508-12-450; John Deere, Moline, IL) system to reach 1-1.5 acre-inch water per week.

Ears from 15 plants were harvested when all plants of an individual cultivar reached maturity. Data to estimate the work involved in hand harvest was recorded. Ears were categorized as marketable or unmarketable, counted and weighed. Ear quality from a subset of 10 ears per plot was also determined.

Husk color, kernel color, husked ear appearance, unhusked ear appearance, the extent to which the husk covered the ear tip (tip cover), kernels filling the tip of the ear (tip fill), and the relative level of work involved in snapping the ear from the culm (picking ease) were rated using a 5 point scale. For husk color and kernel color 1 = light and 5 = dark; husked ear appearance and unhusked ear appearance 1 = poor and 5 = good; tip cover 1 = exposed ear tip, 2 = husk cover less than 0.75 in past ear tip, 3 = 0.75 to 1.24 in, 4 = 1.25 to 2 in, 5 = greater than 2 in; tip fill 5 = kernels filled to tip of ear, 4 = greater than 0.5 in unfilled, 3 = 1 to 1.5 in, 2 = 1.6 to 2 in, 1 = greater than 2 inches; and picking ease 1 = difficult, 5 = easy.

All data were subjected to analysis of variance (ANOVA) using the mixed procedure in SAS (version 9.2; SAS Institute, Cary, NC) with blocks treated as a random variable. When P values were less than or equal to 0.05, means were separated using Tukey's multiple comparison test.

Results

Estimating the work involved in hand harvesting

Plant height at tasseling (VT), the distance from the soil line to the base of the primary ear and picking ease were collected as an indication of the work involved in hand harvesting.

Southwestern Pennsylvania

'Captive' was taller at tasseling than 'Temptation', 83.58 in. versus 77.85 in. (Table 1). 'Jackie', '1273', 'Synergy', 'Paydirt', 'Espresso', and 'Kristine' were shorter and all other cultivars were not different than 'Temptation'. The distance from the base of the primary ear to the soil level was 20.90 in. for 'Temptation' and not different from most other cultivars. 'Mattapoisett' ears were higher at 24.20 in. and '1273', 'Jackie', 'Profit', 'Allure', 'Illusion', 'Synergy', 'Espresso', 'Kristine' and 'Paydirt' were lower. Most cultivars were more difficult to pick than 'Temptation'. 'Edelweiss', 'Espresso', 'Mattapoisett', 'Temptation II', 'Primus', and 'Paydirt' were not different than 'Temptation' in terms of picking ease.

Central Pennsylvania

'Ka-Ching' and 'Silver Duchess' were taller and 'Providence', 'Synergy', '1273' and 'Kristine' shorter at tasseling than 'Temptation' (Table 1). All other cultivars were not different than 'Temptation'. The distance from the soil line to the primary ear of 'Mattapoisett', 'Montauk', 'Captive' and 'Avalon' was higher and lower from 'Synergy', '1273', 'Profit', 'Espresso', 'Jackie', 'Paydirt' and 'Kristine' than 'Temptation'. All other cultivars were not different than 'Temptation'. Most cultivars were not different than 'Temptation' in terms of picking ease. However, 'Mattapoisett', 'Illusion', 'Captive', 'Providence', 'BC 0805', 'Synergy', 'Jackie' and 'Whiteout' were more difficult to pick.

Southeastern Pennsylvania

'Captive', 'Allure' and 'Avalon' were taller than 'Temptation' at tasseling while '1274', 'Kristine', 'Paydirt', '1273' and 'Synergy' were shorter (Table 1). The distance from the base of the primary ear to the soil line for 'Temptation' was 14.18 in. which was not different than most other cultivars. 'Captive', 'Mattapoisett', 'Whiteout', 'Avalon', 'Montauk', 'BC 0805', 'Primus', 'Providence', 'Edelweiss' and 'Silver Duchess' ears were higher. 'Montauk', 'Providence', 'Kristine', 'Ka-Ching', 'Primus', 'Avalon', 'Cuppa Joe', 'BC 0805' and '1274' were more difficult to pick than 'Temptation'. All other cultivars were not different than 'Temptation'.

Harvest season

Sweet corn maturing 65-75 days after planting is considered early season; 76-85 mid-season; and more than 85 days, late season. In central Pennsylvania, 'Paydirt', 'Espresso', 'Temptation', 'Temptation II', 'Illusion', 'Jackie', 'Profit', 'Whiteout', 'Bicolor 1102', and 'Allure' were early-maturing cultivars, while 'Cuppa Joe', 'BC 0805', 'Synergy' and 'Edelweiss' were mid-season cultivars (Table 2). The remaining cultivars were late-season maturing cultivars. In southwestern all cultivars were early maturing. In southeastern Pennsylvania most cultivars were early maturing; however, 'Mattapoisett', 'Providence', 'Avalon', 'Primus', 'Captive' and 'Cuppa Joe' were mid-season cultivars.

Yields

Southwestern Pennsylvania

'Paydirt' produced fewer marketable ears than 'Temptation' (Table 3). The number of ears produced by all other cultivars was not different from 'Temptation'. By weight, 'Paydirt' produced lower marketable yields and 'Avalon', 'Montauk', 'Silver Duchess', 'Illusion', 'Edelweiss', 'Allure', 'Ka-Ching', 'Profit', 'Whiteout', 'BC 0805', and 'Mattapoisett' higher than 'Temptation'.

'Paydirt' produced higher unmarketable yield in number of ears and weight than 'Temptation' which was not different than any other cultivar.

Central Pennsylvania

The number of marketable ears produced by all cultivars was not different from 'Temptation' (Table 3). By weight, 'Montauk', 'Ka-Ching', '1273', 'Edelweiss', 'Silver Duchess', 'Avalon', 'Captive' and 'Mattapoisett' produced higher marketable yields than 'Temptation'.

Unmarketable yield by number and weight of ears was not different from 'Temptation' for any cultivar.

Southeastern Pennsylvania

'Kristine' produced fewer marketable ears than 'Temptation' (Table 3). The number of ears produced by all other cultivars was not different from 'Temptation'. By weight, 'Montauk', 'Ka-Ching', 'Allure', 'Avalon', 'Edelweiss', 'Providence' and 'Espresso' produced higher and 'Paydirt' lower marketable yields than 'Temptation'.

The number of unmarketable ears was not different from 'Temptation' for any cultivar. By weight, unmarketable yields from most cultivars were not different from 'Temptation'; however, they were higher from 'Kristine'.

Ear quality

Ear quality is just as important as marketable yield in making profits. Consumers are first attracted to the appearance of the ear, while taste can result in repeat purchases. In most US markets, consumers prefer an 8-9 in ear with a dark green husk, long and dark green flag leaf, and 16 straight rows of small deep and sweet kernels filled to the tip of the ear (Tracy, 2001).

Southwestern Pennsylvania

'Temptation' had an ear diameter of 1.86 in., which was not different than most other cultivars (Table 4). However, 'Paydirt', 'Primus', 'BC 0805', 'Espresso' and 'Cuppa Joe' had smaller diameter ears. The ear length of most cultivars was not different than 'Temptation' at 7.30 in.; however, 'Avalon', 'BC 0805', 'Providence', 'Primus', 'Silver Duchess', 'Ka-Ching', 'Illusion', 'Espresso' and 'Allure' produced longer ears.

Central Pennsylvania

Husk color of 'Temptation' was in the middle of the scale and not different than most cultivars (Table 5). 'Captive', 'Edelweiss', 'Jackie', 'Whiteout', 'Allure' and 'Silver Duchess' had darker and 'Ka-Ching', '1273' and '1274' had lighter husks than 'Temptation'.

Husk appearance was nicer for 'Whiteout', 'Captive', 'BC 0805', 'Bicolor 1102', 'Edelweiss', 'Jackie', 'Profit', '1274', 'Montauk', 'Primus' and 'Temptation II' compared to 'Temptation'. All other cultivars had husk appearances not different from 'Temptation'. Unhusked ear appearance was generally high (rated 3.75-5.0) and not different from 'Temptation'. However, 'Synergy', 'Illusion' and 'BC 0805' had poorer unhusked appearances (rated 1.5-3.25).

All ears were completely covered by the husk. However, '1274' and '1273' husks extended past the ear less than 'Temptation'. The extent to which husks past the ear for 'Avalon', 'Montauk', 'Allure', 'Whiteout', 'Cuppa Joe' and 'Jackie' was not different than 'Temptation' and greater for all other cultivars. All cultivars had almost complete tip fill and were not different than 'Temptation'.

'Temptation' had an ear diameter of 1.82 in., which was not different than 'Kristine', '1273', 'Avalon', 'Synergy', 'Ka-Ching', 'Bicolor 1102', 'Profit' or 'Providence'. 'Edelweiss', 'Montauk', 'Captive', 'Primus', 'Mattapoisett', '1274' and 'Silver Duchess' had larger ear diameters and the remaining cultivars had smaller ear diameters than 'Temptation'. 'Temptation' had the smallest ear length at 7.46 in. It was not different than 'Jackie', 'Synergy', 'Kristine', 'Temptation II' or 'Paydirt'. The remaining cultivars had longer ears than 'Temptation'.

Kernel color for 'Temptation' was in the mid upper range at 3.8 and not different from 'Primus', 'Allure', '1273', '1274', 'Bicolor 1102', 'Temptation II', 'Whiteout', 'Espresso', 'Profit' or 'Illusion'. 'Avalon', 'Cuppa Joe', 'Ka-Ching', 'Montauk', 'Kristine', 'Providence', and 'Mattapoissett' had darker kernel color and the remaining cultivars, lighter kernel color than 'Temptation'. The number of rows on most ears was not different from 'Temptation'. However, 'Mattapoissett', 'Captive', 'Bicolor 1102', 'Allure' and 'Whiteout' had more rows and 'Ka-Ching' and 'Avalon' had fewer rows.

After husking, ears were evaluated for incidence of insect damage (primarily corn earworm, *Helicoverpa zea*). Damage for 'Temptation' was low and not different than most cultivars. However, 'Avalon', 'Kristine', 'Primus', 'Captive', 'Providence', '1273', '1274', 'Ka-Ching', 'Montauk' and 'Silver Duchess' had a higher incidence.

Southeastern Pennsylvania

Husk color of 'Temptation' was in the mid-range and not different than most other cultivars (Table 6).

However, 'Espresso' and 'Silver Duchess' had a darker husk color and 'BC 0805', 'Cuppa Joe', 'Synergy', '1274', 'Primus', 'Whiteout', 'Captive', 'Avalon' and '1273' lighter.

Husk appearance was not different from 'Temptation' for most cultivars. The husk appearance of 'Avalon' and 'Bicolor 1102' was poorer than 'Temptation'. Unhusked ear appearance was not different from 'Temptation' for most cultivars. 'Montauk', 'Bicolor 1102' and 'Mattapoissett' scored higher in unhusked ear appearance, while '1273', 'Avalon', 'Cuppa Joe', 'Primus' and 'Paydirt' scored lower.

All ears were completely covered by the husk. The extent to which the husk extended past the ear was not different from 'Temptation' for 'Espresso', 'Illusion', 'Silver Duchess', 'Temptation II', 'Kristine', 'Paydirt', 'Ka-Ching', 'Bicolor 1102' and 'Edelweiss'. Husk extension past the ear was less for the remaining cultivars. 'Temptation' scored 3.75 for tip fill indicating roughly 0.5 in. of the tip of the ear was unfilled. This was not different from most other cultivars; however, 'Edelweiss', 'Synergy', 'Jackie', 'Kristine', 'Profit', 'Montauk', 'Paydirt', 'Ka-Ching', 'Mattapoissett' and '1273' scored higher and 'Whiteout' lower.

Ear diameter for 'Temptation' was 1.75 in. which was not different from all other cultivars except 'BC 0805' which was 1.23 in. Ear length for 'Temptation' was 6.69 in. which was not different from most other cultivars except 'Avalon', 'Providence', 'Silver Duchess', 'Espresso', 'Allure' and 'Ka-Ching' which had longer ears.

In general, all white-kernel cultivars scored lower on the rating scale for color than 'Temptation'. Among bicolor cultivars, 'Ka-Ching' and 'Bicolor 1102' scored lower for kernel color and 'Temptation II' higher than 'Temptation'.

Literature Cited

"Sweet Corn" by W.F. Tracy, *In: Specialty Corns*, 2nd ed., 2001, A.R. Hallauer, ed.

Table 1. Plant height at tasseling (VT), distance from the soil line to the base of the primary ear (ear height) and the ease or difficulty of removing the primary ear by hand (picking ease) for 25 cultivars of synergistic sweet corn grown in southwestern, central, and southeastern Pennsylvania in 2012.

Cultivar	Southwestern Pennsylvania			Central Pennsylvania			Southeastern Pennsylvania		
	Plant height at tasseling (in)	Ear height (in)	Picking ease ²	Height at tasseling (in)	Ear height (in)	Picking ease	Height at tasseling (in)	Ear height (in)	Picking ease
1273	69.45f-h ^y	17.25d-f	2.00hi	67.65hi	10.12f-j	10.12f-j	58.83ij	14.63h-l	2.88b-h
Ka-Ching	79.60a-d	19.05c-f	3.00e-g	84.20a	12.18e-g	12.18e-g	72.23b-e	16.58e-k	1.88h-k
Montauk	74.37c-f	19.40c-f	3.00d-h	80.64a-c	16.35a	16.35a	73.80b-d	19.58b-e	2.25f-j
Avalon	81.05ab	19.53c-f	3.00d-h	74.72c-g	15.73a-c	15.73a-c	75.13bc	20.88b-d	1.75i-k
BC 0805	77.30b-d	21.40a-c	2.75f-h	71.58e-h	13.07de	13.07de	72.63b-e	19.00b-e	1.63jk
Edelweiss	77.45b-d	20.45b-d	5.00a	81.77ab	13.25de	13.25de	72.15b-e	17.95d-h	3.63a-c
Silver Duchess	77.75b-d	20.70bc	3.00e-g	84.09a	12.37ef	12.37ef	72.70b-e	17.90d-h	3.13a-g
Whiteout	74.65de	23.55ab	2.00hi	73.71d-h	14.92a-d	14.92a-d	72.90b-e	22.35a-c	2.75c-i
Captivate	83.58a	21.30a-c	3.00d-h	78.10a-d	16.96ab	16.96ab	82.65a	24.78a	3.25a-f
Temptation II	77.90b-d	23.10ab	4.25a-c	80.97a-c	14.95a-d	14.95a-d	69.80c-f	17.08e-j	3.47a-d
Mattapoisett	78.00a-d	24.20a	4.50ab	72.58d-h	16.72a	16.72a	72.13b-e	22.40ab	2.38e-j
Providence	76.58b-d	20.53b-e	3.00d-h	69.66g-i	12.54e	12.54e	70.50c-e	18.35d-g	2.13g-k
1274	-	-	-	70.83f-h	12.08e-h	12.08e-h	62.95hi	14.95g-l	1.13k
Bicolor 1102	79.90a-c	21.75a-c	2.00hi	77.94a-e	14.04b-e	14.04b-e	70.30c-e	17.43d-i	2.50d-j
Temptation	77.85b-d	20.90bc	4.50ab	76.77b-f	13.37de	13.37de	68.93d-g	14.18i-m	3.38a-e
Illusion	76.90b-d	16.20fg	3.50c-f	76.38b-f	13.07de	13.07de	72.98b-e	15.20g-l	2.50d-j
Jackie	70.45e-g	17.15ef	3.50c-f	73.43d-h	9.88h-j	9.88h-j	67.15e-h	16.83e-j	3.88ab
Cuppa Joe	78.30a-d	19.10c-f	3.25d-g	81.84ab	15.18a-d	15.18a-d	70.00c-e	16.65e-k	1.75i-k
Espresso	65.45gh	13.85gh	5.00a	70.78f-h	9.95g-j	9.95g-j	64.10f-i	13.20k-m	2.50d-j
Profit	76.75b-d	16.80fg	3.25d-g	78.05a-d	9.97g-j	9.97g-j	63.83g-i	13.58j-m	2.75c-i
Allure	81.85ab	16.80fg	2.75f-h	81.83ab	13.54c-e	13.54c-e	77.10ab	15.28f-l	2.88b-h
Paydirt	67.50gh	11.70h	3.75b-e	71.92d-h	9.78ij	9.78ij	59.35i	10.73m	2.50d-j
Primus	75.33c-e	18.48c-f	4.00b-d	75.78b-g	14.89a-d	14.89a-d	69.83c-f	18.80c-f	1.75i-k
Synergy	68.80f-h	16.15fg	1.50i	68.29hi	10.25f-i	10.25f-i	53.05j	11.73lm	4.13a
Kristine	64.50h	12.65h	2.50gh	63.89i	7.86j	7.86j	61.03i	12.58lm	2.00h-k

²1-5 rating scale; 5 = easy, 1 = difficult

^yValues are the mean of 4 replications; values followed by different letters within a column are significantly different using Tukey's multiple comparison test at the 5% level; green font color indicates values significantly higher than the standard 'Temptation', red indicates lower and black indicates not different.

Table 2. Days to maturity listed with the seed company, date harvested, days after planting harvested (DAP) and growing degree days accumulated at harvest using a base temperature of 50°F (GDD) of 25 cultivars of synergistic sweet corn grown in southwestern, central, and southeastern Pennsylvania in 2012.

Cultivar	Days to Maturity	Southwestern Pennsylvania			Central Pennsylvania			Southeastern Pennsylvania					
		Date Harvested	DAP	GDD (planted June 6, 2012)	Date Harvested	DAP	GDD (planted June 1, 2012)	Date Harvested	DAP	GDD (planted May 21, 2012)			
Paydirt	70	August 8	63	1646	August 13	74	1527.1	July 27	68	1614.5			
Espresso	71												
Temptation	72	August 10	65	1693				August 13	74	1527.1	July 30	71	1691.0
Temptation II	72												
Illusion	72												
Jackie	72												
Whiteout	72	August 13	68	1748				August 13	74	1527.1	August 1	72	1740.5
Profit	72												
Cuppa Joe	73	August 8	63	1646	August 14	75	1544.8				August 6	78	1881.0
Bicolor 1102	74	August 13	68	1748	August 13	74	1527.1				July 30	71	1691.0
Allure	75	August 14	69	1771							August 1	72	1740.5
Synergy	76	August 13	68	1748	August 17	78	1596.7				July 30	71	1691.0
Edelweiss	76				August 20	81	1635.8						
Kristine	77	August 14	69	1771	August 28	89	1780.2	August 1	72	1740.5			
Ka-Ching	78	August 13	68	1748				August 3	75	1793.5			
1273	78							August 1	72	1740.5			
Silver Duchess	78							July 30	71	1691.0			
1274	78	-	-	-	August 29	90	1794.5	August 3	75	1793.5			
Montauk	79	August 15	70	1792.5									
Mattapoissett	80	August 14	69	1771	August 28	89	1780.2	August 6	78	1881.0			
Providence	80	August 15	70	1792.5									
BC 0805	82	August 14	69	1771	August 14	75	1544.8	July 30	71	1691.0			
Avalon	82	August 18	73	1853	August 29	90	1794.5	August 6	78	1881.0			
Primus	84	August 15	70	1792.5	August 30	91	1809.0						
Captivate	88	August 18	73	1853									

Table 3. Marketable and unmarketable yield of 25 cultivars of synergistic sweet corn grown in southwestern, central, and southeastern Pennsylvania in 2012.

Cultivar	Marketable Yield						Unmarketable Yield					
	Southwestern PA		Central PA		Southeastern PA		Southwestern PA		Central PA		Southeastern PA	
	no./15 plants	lb/15 plants	no./15 plants	lb/15 plants	no./15 plants	lb/15 plants	no./15 plants	lb/15 plants	no./15 plants	lb/15 plants	no./15 plants	lb/15 plants
1273	14.8a ^z	11.1c-h	19.5	16.5ab	14.8ab	10.0c-g	0.3b	0.1b	0.0	0.0	0.3	0.2ef
Ka-Ching	14.5a	12.6a-e	19.5	16.7ab	14.8ab	11.7b	0.0b	0.0b	0.0	0.0	0.3	0.2ef
Montauk	14.7a	13.7ab	17.8	19.5a	15.0a	13.6a	0.3b	0.2b	0.3	0.3	0.0	0.0f
Avalon	15.1a	14.1a	17.0	14.8b-e	14.8ab	11.0b-d	0.0b	0.0b	0.0	0.0	0.3	0.1ef
BC 0805	14.5a	12.4a-f	16.8	12.4d-i	12.8d-f	9.6d-g	0.0b	0.0b	0.5	0.3	2.3	1.3a-c
Edelweiss	15.0a	12.6a-d	16.8	15.9bc	13.3b-f	10.8b-e	0.0b	0.0b	0.0	0.0	2.0	1.4ab
Silver Duchess	15.0a	12.8a-c	16.5	15.2b-d	13.3b-f	10.0d-g	0.0b	0.0b	0.0	0.0	1.8	1.1a-d
Whiteout	15.0a	12.4a-f	15.8	11.2f-j	13.8a-e	9.7d-g	0.0b	0.0b	0.0	0.0	1.3	0.7b-f
Captivate	14.0a	10.7d-i	15.8	14.7b-e	13.5a-e	8.6g-i	1.0b	0.5b	0.0	0.0	1.4	0.8b-f
Temptation II	14.3a	10.6f-i	15.8	11.6e-j	13.8a-e	9.1f-h	0.8b	0.4b	0.3	0.2	1.3	0.7b-f
Mattapoisett	14.8a	12.1a-g	15.3	14.6b-f	13.3b-f	10.4b-f	0.0b	0.0b	0.0	0.0	1.8	1.0a-e
Providence	13.0a	11.6b-h	15.3	13.8b-g	14.3a-d	10.8b-e	1.7b	1.2b	0.0	0.0	0.8	0.4c-f
1274	-	-	15.0	13.8b-h	13.8a-e	9.8d-g	-	-	0.3	0.2	1.3	0.6b-f
Bicolor 1102	14.5a	11.6b-h	15.0	12.2d-j	14.3a-d	10.4b-f	0.5b	0.2b	0.0	0.0	0.8	0.5c-f
Temptation	14.8a	10.2hi	15.0	10.9g-j	13.8a-e	8.9f-h	0.3b	0.2b	0.3	0.2	1.3	0.7b-f
Illusion	14.5a	12.7a-d	14.8	10.9g-j	13.3b-f	10.3b-f	0.5b	0.3b	0.3	0.1	1.5	0.8a-f
Jackie	13.5a	9.0i	14.5	9.6ij	13.0c-f	8.6g-i	1.5b	0.8b	0.3	0.1	2.0	1.2a-d
Cuppa Joe	14.5a	10.6e-i	14.3	11.4e-j	13.5a-e	9.3e-g	0.0b	0.0b	0.0	0.0	2.0	0.7b-f
Espresso	15.0a	11.0c-h	14.3	10.4h-j	14.0a-e	10.8b-e	0.0b	0.0b	0.3	0.2	1.0	0.6b-f
Profit	14.5a	12.5a-f	14.3	10.5g-j	14.5a-c	10.0c-g	0.3b	0.1b	0.0	0.0	1.3	0.3d-f
Allure	15.0a	12.6a-d	14.0	11.7d-j	14.8ab	11.6bc	0.0b	0.0b	0.0	0.0	0.3	0.1ef
Paydirt	8.8b	3.5j	14.0	8.8j	12.5ef	7.1i	6.3a	3.5a	1.5	0.8	2.5	1.0a-e
Primus	13.3a	11.0c-h	14.0	12.7c-i	12.5ef	8.9f-h	1.3b	0.8b	0.0	0.0	2.5	1.4ab
Synergy	14.0a	9.9hi	14.0	11.6e-j	13.5a-e	9.0f-h	1.0b	0.6b	0.0	0.0	2.5	0.8b-f
Kristine	15.0a	10.4g-i	12.8	9.4ij	11.8f	7.5hi	0.0b	0.0b	0.3	0.2	3.3	1.7a

^z Values are the mean of 4 replications; values followed by different letters within a column are significantly different using Tukey's multiple comparison test at the 5% level; green font color indicates values significantly higher than the standard 'Temptation', red indicates lower and black indicates not different.

Table 4. Ear diameter and ear length of 24 cultivars of synergistic sweet corn grown in southwestern Pennsylvania in 2012.

Cultivar	Ear diameter (in)	Ear length (in)
Edelweiss	2.138a ²	7.15g
Whiteout	1.925b	7.86b-f
Montauk	1.908bc	8.03a-e
Avalon	1.865bc	8.80a
Temptation	1.863bc	7.30e-g
Profit	1.831b-d	7.24fg
Synergy	1.831b-d	7.08g
Illusion	1.830b-d	8.33ab
Captivate	1.816b-d	7.95b-f
Allure	1.813b-d	8.04b-d
Temptation II	1.813b-d	7.59c-g
1273	1.806b-d	7.35e-g
Bicolor 1102	1.800b-d	7.39c-g
Jackie	1.770b-d	6.99g
Kristine	1.769b-d	7.38d-g
Mattapoisett	1.769b-d	7.50c-g
Silver Duchess	1.763b-d	8.36ab
Ka-Ching	1.756cd	8.34ab
Providence	1.733c-e	8.43ab
Paydirt	1.681de	7.55c-g
Primus	1.681de	8.39ab
BC 0805	1.675de	8.49ab
Espresso	1.588ef	8.06a-c
Cuppa Joe	1.438f	7.25fg

²Values are the mean of 4 replications; values followed by different letters within a column are significantly different using Tukey's multiple comparison test at the 5% level; green font color indicates values significantly higher than the standard 'Temptation', red indicates lower and black indicates not different.

Table 5. Ear quality measurements of 25 cultivars of synergistic sweet corn grown in central Pennsylvania in 2012.

Cultivar	Husk color ^z	Husk appearance ^y	Unhusked appearance ^y	Tip cover ^x	Tip fill ^w	Ear diameter (in)	Ear length (in)	Kernel color ^z	No. rows	Insect damage ^v (no. ears/10 ears)
Captivate	5.00a ^u	5.0a	5.00a	5.00a	5.00	2.01b	9.02ab	1.0j	17.50b	2.3b-d
Edelweiss	5.00a	4.8ab	4.00b-d	5.00a	5.00	2.21a	8.10g-i	2.0hi	15.95d-g	0.8d-f
Jackie	5.00a	4.8ab	4.25a-c	3.50cd	5.00	1.62hi	7.72j-l	1.8ij	15.75e-h	0.5ef
Whiteout	5.00a	5.0a	3.75cd	4.00bc	5.00	1.58hi	8.29f-h	3.8c-f	16.95b-e	0.5ef
Allure	4.25b	4.0b-e	4.50a-c	4.00bc	5.00	1.62hi	9.03ab	4.3a-d	17.20b-d	0.0f
Silver Duchess	4.25b	4.3a-d	4.00b-d	5.00a	5.00	1.94bc	8.68c-e	2.0hi	15.10f-i	2.0b-e
BC0805	4.00bc	4.8ab	1.50f	5.00a	5.00	1.44j	8.98a-c	1.5ij	15.40f-h	0.1f
Temptation II	4.00bc	4.5a-c	4.50a-c	5.00a	5.00	1.67gh	7.62kl	4.0b-e	14.95g-i	0.1f
Paydirt	3.75b-d	3.3e-g	4.50a-c	5.00a	4.75	1.51ij	7.59kl	2.8gh	13.90ij	0.8d-f
Profit	3.75b-d	4.8ab	4.50a-c	5.00a	5.00	1.78e-g	7.86i-k	3.3e-g	16.35b-f	0.1f
Bicolor 1102	3.75b-d	4.8ab	4.00b-d	5.00a	5.00	1.78e-g	7.96h-j	4.0b-e	17.35bc	0.1f
Cuppa Joe	3.75b-d	3.8c-f	4.25a-c	3.75bc	4.40	1.57hi	8.60d-f	5.0a	15.80e-g	1.3c-f
Kristine	3.50c-e	3.5d-g	4.50a-c	5.00a	4.75	1.93b-d	7.66j-l	4.8ab	15.15f-i	3.3ab
Mattapoissett	3.50c-e	4.3a-d	4.75ab	5.00a	4.75	1.96bc	8.83b-d	4.8ab	19.00a	0.8d-f
Synergy	3.50c-e	4.3a-d	3.25de	5.00a	5.00	1.81ef	7.67j-l	2.8gh	15.00f-i	0.1f
Temptation	3.50c-e	3.5d-g	4.25a-c	4.00bc	5.00	1.82d-f	7.46l	3.8c-f	15.10f-i	0.3f
Montauk	3.25de	4.5a-c	5.00a	4.25b	4.88	2.17a	8.91b-d	5.0a	16.00c-g	2.0b-e
Primus	3.25de	4.5a-c	4.98ab	5.00a	5.00	1.98bc	8.95bc	4.6a-c	16.13b-g	2.8bc
Espresso	3.25de	4.0b-e	4.75ab	5.00a	4.75	1.63h	8.36e-g	3.5d-g	16.30b-g	0.3f
Providence	3.00e	3.3e-g	4.75ab	5.00a	4.50	1.75fg	9.03ab	4.8ab	14.95g-i	2.3b-d
Avalon	3.00e	3.5d-g	5.00a	4.25b	5.00	1.88c-e	9.29a	5.0a	13.25j	4.8a
Illusion	3.00e	3.0fg	2.75e	5.00a	5.00	1.57hi	8.20gh	3.0fg	15.25f-i	0.1f
Ka-Ching	2.25f	2.8g	4.00b-d	5.00a	4.33	1.79ef	8.58d-f	5.0a	13.45j	2.0b-e
1273	2.25f	4.0b-e	5.00a	3.00d	5.00	1.89c-e	8.06g-i	4.0b-e	14.40h-j	2.0b-e
1274	2.00f	4.5a-c	5.00a	2.00e	4.75	1.95bc	8.37e-g	4.0b-e	15.65e-h	2.0b-e

^z1-5 visual rating scale; 5 = dark, 1 = light.

^y1-5 visual rating scale; 5 = good, 1 = poor.

^x1-5 rating scale; 1 = exposed ear tip, 2 = husk cover less than 0.75 in past ear tip, 3 = 0.75 to 1.24 in, 4 = 1.25 to 2 in, 5 = greater than 2 in.

^w1-5 rating scale; 5 = kernels filled to tip of ear, 4 = greater than 0.5 in unfilled, 3 = 1 to 1.5 in, 2 = 1.6 to 2 in, 1 = greater than 2 inches.

^vInsect damage primarily due to corn earworm (*Helicoverpa zea*).

^uValues are the mean of 4 replications; values followed by different letters within a column are significantly different using Tukey's multiple comparison test at the 5% level; green font color indicates values significantly higher than the standard 'Temptation', red indicates lower and black indicates not different.

Table 6. Ear quality measurements of 25 cultivars of synergistic sweet corn grown in southeastern Pennsylvania in 2012.

Cultivar	Husk color ^z	Husk appearance ^y	Unhusked appearance ^y	Tip cover ^x	Tip fill ^w	Ear diameter (in)	Ear length (in)	Kernel color ^z
Espresso	4.75a ^y	4.00ab	3.8a-d	5.00a	3.75gh	1.81a-c	8.00a-d	3.5ab
Silver Duchess	4.25ab	3.75a-c	3.5b-e	5.00a	4.00e-h	1.63c	8.06a-c	1.0h
Bicolor 1102	4.13bc	2.13f	4.0ab	4.25b-d	4.13d-h	1.75a-c	6.88c-g	2.4f
Illusion	4.13bc	2.85c-f	3.9a-c	5.00a	3.88f-h	1.72bc	7.63a-f	1.5gh
Profit	4.13bc	2.56d-f	3.3d-g	4.75ab	4.63a-d	1.78a-c	6.94c-g	3.5ab
Mattapoissett	3.88b-d	2.63d-f	4.0ab	2.88g-i	4.38a-f	1.75a-c	7.75a-e	1.6g
Montauk	3.88b-d	4.13a	4.3a	3.50e-g	4.50a-e	1.91ab	7.56a-f	3.5ab
Paydirt	3.75b-e	3.50a-d	2.3j	4.75ab	4.50a-e	1.56c	7.19b-g	3.0b-e
Allure	3.63c-f	3.25a-e	3.8c-f	2.25i-k	3.63h	1.78a-c	7.94a-d	3.4a-c
Temptation	3.63c-f	3.50a-d	3.4c-f	5.00a-c	3.75gh	1.75a-c	6.69e-g	3.0b-e
Edelweiss	3.50d-g	3.50a-d	3.5b-e	4.00c-e	4.88a	2.00a	7.25b-g	1.0h
Ka-Ching	3.50d-g	2.75c-f	2.9e-i	4.63a-c	4.38a-f	1.75a-c	7.94a-d	2.4f
Kristine	3.50d-g	2.75c-f	3.1e-h	4.75ab	4.63a-d	1.72bc	6.81d-g	3.1a-d
Providence	3.25e-h	3.50a-d	2.9f-i	2.94gh	4.13d-h	1.63c	8.19ab	2.8d-f
Temptation II	3.25e-h	4.25a	3.3d-g	5.00a	4.25b-g	1.75a-c	6.81d-g	3.6a
Jackie	3.13f-h	2.81c-f	3.1e-h	3.38e-h	4.75a-c	1.75a-c	6.50fg	2.9c-e
BC 0805	3.00gh	2.94c-f	2.9f-i	3.63d-f	4.19c-h	1.22d	6.25g	2.5ef
Cuppa Joe	3.00gh	3.38a-e	2.5ij	3.25f-h	3.75gh	1.72bc	7.44a-g	3.3a-d
Synergy	3.00gh	3.56a-d	3.0e-i	3.63d-f	4.81ab	1.81a-c	6.69e-g	2.9c-e
1274	2.94gh	2.94c-f	2.8f-j	2.13jk	4.13d-h	1.81a-c	7.13b-g	3.3a-d
Primus	2.88h	2.88c-f	2.5ij	3.63d-f	3.98e-h	1.59c	7.69a-f	3.0b-e
Whiteout	2.88h	3.00b-f	3.1e-h	3.00f-h	3.00i	1.78a-c	7.63a-f	1.4gh
Captivate	2.81h	3.69a-c	3.3d-g	2.88g-i	4.25b-g	1.72bc	7.44a-g	1.5gh
Avalon	2.69h	2.38ef	2.6h-j	1.88k	4.13d-h	1.63c	8.50a	1.5gh
1273	2.69h	3.31a-e	2.8g-j	2.75h-j	4.38a-f	1.78a-c	7.00b-g	2.8d-f

^z1-5 visual rating scale; 5 = dark, 1 = light.

^y1-5 visual rating scale; 5 = good, 1 = poor.

^x1-5 rating scale; 1= exposed ear tip, 2 = husk cover less than 0.75 in past ear tip, 3 = 0.75 to 1.24 in, 4 = 1.25 to 2 in, 5 = greater than 2 in.

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^yValues are the mean of 4 replications; values followed by different letters within a column are significantly different using Tukey's multiple comparison test at the 5% level; green font color indicates values significantly higher than the standard 'Temptation', red indicates lower and black indicates not different.