

Preliminary and Regional Reports

1998 Ornamental Corn Trial in Pennsylvania

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ADDITIONAL INDEX WORDS. *Zea mays*

SUMMARY. Twenty-two ornamental corn (*Zea mays*) cultivars were evaluated in the summer of 1998. The cultivars were evaluated for marketable yield, percent cull, stalk characteristics, and ear characteristics. In addition, three ears of each cultivar were photographed to show size and variability in kernel color. The marketable yield of each cultivar was generally related to percent germination, established plant population, and ear size. Highest marketable yields (dozen/acre) were generally harvested from small-eared cultivars [ear size 2.0 to 4.5 inches (5.1 to 11.4 cm)]. Data from this trial suggest that multiple cultivars should be grown in Pennsylvania based on market

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requirements and extremes in weather patterns throughout the state.

Ornamental or indian corn has become a very important decorative crop in Pennsylvania over the last 10 years. Ornamental corn types vary in size of ear, kernel, husk and stalk color. Sales of ornamental corn primarily occur dur-

ing the Halloween season. Both ears and stalks can be sold; three ears with dried husks tied together and 6 to 12 stalks tied in a bundle. In the last 10 years, the acreage of ornamental corn has increased about 40% in the state. Most growers produce ornamental corn for roadside and farmers' markets, which demand very attractive and high quality ears. New ornamental corn cultivars have been developed with the smaller, 2.0- to 4.5-inch, ear length, becoming more popular than the traditional large ear types [7.0 to 9.0 inches (17.8 to 22.9 cm)]. Corn breeders have also been able to produce cultivars with very intense colors ranging from blue, brown, white, purple, red and yellow, as well as mixtures of kernel colors on the same ear (Dickinson, 1992). The combination of ear length and kernel color has enabled consumers to use ornamental corn in decorative pieces that can be displayed for the holiday season starting with Halloween and ending with Valentines Day (Jones et al., 1981).

Materials and methods

Twenty-two ornamental corn cultivars were evaluated at the Horticulture Research Farm, Russell E. Larson Research Center, Rock Springs, Pa. The large-seeded ornamental corn cultivars were direct seeded with a International

Table 1. Weather data for the 12-week ornamental corn trial conducted at the Horticulture Research Farm, Russell E. Larson Research Center, Rock Springs, Pa., in 1998.

Month	Week	Air temp (°F) ^z		Total precipitation (inches) ^y	Avg. soil temp (°F) ^{z,x}
		high	low		
May	29-5	70.9	34.1	1.7	54.6
	6-12	68.7	47.5	2.2	56.7
	13-19	85.6	40.9	0.0	62.1
	20-26	83.6	36.2	0.0	63.7
	27-2	85.9	44.9	1.2	67.4
June	3-9	65.0	37.6	0.0	59.8
	10-16	79.1	53.1	2.7	62.1
	17-23	84.1	54.9	1.2	68.0
	24-30	86.7	61.0	0.7	72.2
July	1-7	79.9	48.9	0.4	68.8
	8-14	82.8	46.2	1.6	69.7
	15-21	82.9	52.4	1.0	72.2
	22-28	82.4	49.7	0.3	71.6
August	29-4	81.5	45.6	0.2	71.6
	5-11	82.4	54.7	1.7	73.7
	12-18	80.5	50.2	0.8	71.0
	19-25	84.6	43.5	0.1	69.3
	26-1	82.7	47.0	0.0	70.0

^z°C = 5/9(°F - 32).

^y1.0 inch = 2.54 cm.

^xRecorded at 7.9 inches (20 cm) depth.

185 plate planter (International Harvester Co., Chicago) [8-inch (20.3-cm) spacing] on 1 June 1998 and the small-seeded cultivars were direct seeded with a Planet Junior (S.L. Allen & Co., Inc., Philadelphia) on 5 June 1998. The soil type was a Hagerstown silt loam with good drainage. On 13 May 1998, prior to seeding, 100 lb/acre (112.2 kg·ha⁻¹) of 1N-1P-1K fertilizer was broadcast on the fall-plowed wheat (*Triticum aestivum*) field and harrowed to incorporate the fertilizer. An additional 50 lb/acre (56.1 kg·ha⁻¹) of nitrogen as ammonium nitrate was applied as a sidedress application on 22 June 1998. The weather data for the 12 week trial at the Horticulture Research Farm, Russell E. Larson Research Center, Rock Springs, Pa., is presented in Table 1. The trial design was a randomized complete block with three replications. Individual plots were 25 ft (7.6 m) and consisted of four rows. Statistical analy-

sis were performed on data using analysis of variance, and means separated where appropriate using Fisher's protected least significant difference ($P = 0.05$) (PROC ANOVA; SAS Institute, Cary, N.C.).

Since June and July were fairly wet (8.0 inches of rain), no irrigation was applied to the ornamental corn trial during the growing season. No major diseases were encountered during production. The corn was cultivated several times throughout the growing season, since no herbicides were applied to the field for weed control. Because there were several acres of sweet corn planted in close proximity to the ornamental corn, the worm complexes, which normally attack corn, were not a problem on the ornamental corn variety trial. Ornamental corn quality characteristics were collected from five ears in all the replications. Each of these ears had the husks pulled back, measured, and was photographed.

Ornamental corn seed was obtained from the following sources: Harris-Moran Seed Co. (Modesto, Calif.), Rupp Seed, Inc. (Wauseon, Ohio), Seneca Hybrids (Hall, N.Y.), and Stokes Seeds Inc. (Buffalo, N.Y.).

Results and discussion

The ornamental corn cultivars were divided into three groups based on ear size; short ears = 2.0 to 4.5 inches (5.1 to 11.4 cm) in length, medium ears = 5.0 to 7.0 inches (12.7 to 17.8 cm) in length, and long ears = 7.0 to 9.0 inches (17.8 to 22.9 cm) in length.

SHORT-EARED CULTIVARS. The highest marketable yield among the short ear ornamental corn cultivars was 'Cutie Pops', which produced significantly more than all the other cultivars evaluated except for 'Cutie Brown' (Table 2). 'Cutie Blues' had the lowest marketable yield due mainly to poor tip fill of the ears, partially due to the late planting date in 1998. 'Wampum' and 'Chinook' produced the longest ears and 'Cutie Blues' had the shortest ears (Table 3). Most ears of 'Cutie Blues' were nonmarketable because of poor tip fill (Table 2). 'Laser Mixed' matured about a week earlier than the other short-eared cultivars and had petite kernels with contrasting colors. Most of the short-eared ornamental corn cultivars were relatively uniform in height with the exception of 'Chinook', which was short with four suckers per plant (Table 4). Stalk color of the various ornamental corn cultivars ranged from pure green to 50% red; red stalks were more attractive than green stalks for use in Halloween decorations. 'Wampum' ears appeared stubby because of ear diameter and length while 'Cutie Pops' ears appeared petite due to the small kernel size (Fig. 1). Kernel colors of the short-eared cultivars included yellow, blue, red, orange, black, and pink in various combinations (Fig. 2).

MEDIUM-EARED CULTIVARS. The highest marketable yield for the medium ear ornamental corn cultivars was 'Mini Indian', which produced significantly more than all the other medium-eared cultivars evaluated (Table 2). 'Red Stalker' had the lowest marketable yield mainly due to poor ear production. However, 'Red Stalker' produced the longest ears and 'Mini Indian' had the shortest ears (Table 3). 'Little Bell' had the fewest culls of the medium-eared cultivars and more contrast of kernel colors and husk appearance. Most of the

Table 2. Seed source, total and marketable yield of 22 ornamental corn cultivars evaluated at the Horticulture Research Farm, Rock Springs, Pa., in 1998.

Cultivar	Source ^y	Total yield (dozen/acre) ^x	Marketable yield (dozen/acre)	Culls (%)
Short-eared^z				
Wampum	Rupp	2270	1495	34
Chinook	Rupp	1699	1005	41
Laser Mixed	Stokes	2401	1552	35
Cutie Pops	Stokes	3659	2434	33
Cutie Brown	Stokes	3602	1707	53
Cutie Pink	Stokes	2434	1094	55
Cutie Blues	Stokes	521	343	34
LSD _{0.05}	1117	863		
Medium-eared				
Fiesta	Stokes	1127	863	23
Red Stalker	Seneca	809	531	35
Little Bell	Rupp	1821	1364	25
Mini Indian	Seneca	2368	1331	44
LSD _{0.05}	234	297		
Long-eared				
Indian	Seneca	1372	809	41
Blue Hopi	Rupp	1029	343	67
Wilda's Pride	Harris-Moran	866	515	40
Earth Shades	Stokes	849	294	64
Ind. Art 105	Rupp	1503	1103	27
Ind. Art 101	Rupp	1127	817	27
Ind. Art 102	Rupp	866	711	18
Bloody Butcher	Rupp	1143	621	46
Ind. Art 104	Rupp	890	621	30
Calico Indian	Stokes	1005	384	62
Ind. Ornamental	Harris-Moran	849	261	69
LSD _{0.05}		248	238	

^zShort-eared = 2.0–4.5 inches (5.1–11.4 cm), medium-eared = 5.0–7.0 inches (12.7–17.8 cm), long-eared = 7.0–9.0 inches (17.8–22.9 cm).

^yHarris-Moran = Harris-Moran Seed Co., Modesto, Calif.; Rupp = Rupp Seed, Inc., Wauseon, Ohio; Seneca = Seneca Hybrids, Hall, N.Y.; Stokes = Stokes Seeds, Inc., Buffalo, N.Y.

^x1 dozen/acre = 29.7 ears/ha.

medium-eared ornamental corn cultivars were relatively uniform in height with an average of two suckers per plant (Table 4). Stalk color of the various medium-eared ornamental corn cultivars ranged from pure green to 50% red. 'Mini Indian' ears appeared petite because of the small kernel size (Fig. 3). Kernel colors of the medium-eared cultivars included yellow, blue, red, orange, and black in various combinations (Fig. 4).

LONG-EARED CULTIVARS. The highest marketable yield for the long ear ornamental corn cultivars was obtained with 'Indian Art 105' and 'Indian', which produced significantly more marketable ears than all the other long-eared cultivars evaluated (Table 2). Five cultivars had low marketable yields [about 850 dozen/acre (25,204 ears/ha)] including 'Wilda's Pride', 'Earth Shades', 'Indian Art 102', 'Indian Art 104' and 'Indian Ornamental'. 'Wilda's Pride' and 'Calico Indian' produced the longest ears (Table 3, Fig. 5). 'Wilda's

Table 3. Ear characteristics of 22 ornamental corn cultivars evaluated at the Horticulture Research Farm, Rock Springs, Pa., in 1998.

Cultivar	Ear ht (inches) ²	Ear length (inches)	Ear diam (inches)	Husk color (%red unless indicated)
Short-eared				
Wampum	33	4.6	1.3	0
Chinook	18	4.6	1.3	<25
Laser Mixed	36	4.3	1.3	0
Cutie Pops	33	4.2	0.9	<25
Cutie Brown	35	4.3	1.1	<10
Cutie Pink	43	3.0	0.9	0
Cutie Blues	38	2.1	0.5	0
LSD _{0.05}		1.4	0.4	
Medium-eared				
Fiesta	20	6.5	1.6	<30
Red Stalker	30	6.9	1.6	red/white
Little Bell	40	6.1	1.5	<30
Mini Indian	38	5.2	1.4	<10
LSD _{0.05}			0.2	
Long-eared				
Indian	24	7.4	1.7	0
Blue Hopi	28	7.6	1.8	0
Wilda's Pride	44	9.3	2.4	red/white
Earth Shades	55	7.1	2.2	0
Ind. Art 105	34	7.6	1.6	<10
Ind. Art 101	31	7.1	1.7	<10
Ind. Art 102	34	7.6	1.6	<10
Bloody Butcher	42	7.4	2.0	light brown
Ind. Art 104	29	7.8	1.7	<10
Calico Indian	36	8.5	1.7	<25
Ind. Ornamental	45	7.8	1.7	<50
LSD _{0.05}		0.6	0.5	

²Short-eared = 2.0–4.5 inches (5.1–11.4 cm), medium-eared = 5.0–7.0 inches (12.7–17.8 cm), long-eared = 7.0–9.0 inches (17.8–22.9 cm).

¹1.0 inch = 2.54 cm.

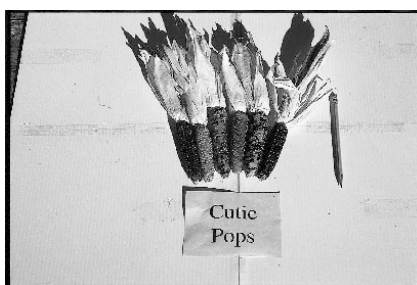


Fig. 1. The short-eared ornamental corn cultivar 'Cutie Pops' from Stokes Seed Co., Buffalo, N.Y.



Fig. 2. The short-eared ornamental corn cultivar 'Laser Mixed' from Stokes Seed Co., Buffalo, N.Y.



Fig. 3. The medium-eared ornamental corn cultivar 'Mini Indian' from Seneca Seed Co., Hall, N.Y.



Fig. 4. The medium-eared ornamental corn cultivar 'Little Bell' from Rupp Seed Co., Wauseon, Ohio.



Fig. 5. The long-eared ornamental corn cultivar 'Wilda's Pride' from Harris-Moran Seed Co., Modesto, Calif.



Fig. 6. The long-eared ornamental corn cultivar 'Indian Art 101' from Rupp Seed Co., Wauseon, Ohio.

Table 4. Stalk characteristics of 22 ornamental corn cultivars evaluated at the Horticulture Research Farm, Rock Springs, Pa., in 1998.

Cultivar	Tassel ht (inches) ^z	No. of suckers	Stalk color (% red, unless otherwise indicated)
Short-eared			
Wampum	77	2	< 50
Chinook	48	4	50
Laser Mixed	80	2	< 50
Cutie Pops	75	4	25
Cutie Brown	81	2	15
Cutie Pink	75	3	0
Cutie Blues	60	2	0
Medium-eared			
Fiesta	87	2	30
Red Stalker	79	2	50 red/mixed
Little Bell	82	2	30
Mini Indian	87	3	0
Long-eared			
Indian	84	3	40 red/mixed
Blue Hopi	74	3	0
Wilda's Pride	110	0	30 red/mixed
Earth Shades	136	0	0
Ind. Art 105	86	1	50
Ind. Art 101	93	1	< 10
Ind. Art 102	105	0	50
Bloody Butcher	98	0	<10
Ind. Art 104	85	0	10
Calico Indian	98	2	25
Ind. Ornamental	103	1	>50

^zShort-eared = 2.0–4.5 inches (5.1–11.4 cm), medium-eared = 5.0–7.0 inches (12.7–17.8 cm), long-eared = 7.0–9.0 inches (17.8–22.9 cm).

^y1.0 inch = 2.54 cm.

Pride' produced tall plants with no suckers and ears with a wide range of kernel colors. 'Earth Shades' produced the tallest plant [136 inches (345 cm)] and 'Blue Hopi' produced the shortest plants [(74 inches (188 cm))] (Table 4). Stalk color of the various long-eared ornamental corn cultivars ranged from pure green to 50% red. Kernel color of 'Earth Shades' was very dark, mainly dark red, blue and black; in contrast, ears of 'Indian Art 101' had consistently more brilliant kernel and husk colors compared to the other long-eared cultivars (Fig. 6). Kernel colors of the long-eared cultivars included white, yellow, blue, red, and black in various combinations.

Results from our trial suggest that for Pennsylvania growers, several new ornamental corn cultivars, especially small-eared types, can produce high yields of marketable ears (Fig. 7). However, it is our observation that no single ornamental corn cultivar will consistently produce high quality appearing kernels and ears from year to year, and that cultivars should be chosen based on quality attributes and multiple year performance. Cultivar performance was ranked based on marketable yield as well as ear length, kernel color combinations, complete tipfill, and husk color. The data from this trial suggests, the six top ornamental corn cultivars that would

be recommended for Pennsylvania growers include 'Cutie Pops', 'Laser Mixed', 'Little Bell', 'Mini Indian', 'Indian Art 101' and 'Wilda's Pride'.

Literature cited

Dickinson, G.W. 1992. Specialty corns. N.M. State Univ. Guide H-232.
 Jones, T., J. Strang, B. Rowell, R. Bessin, B. Nesmith, S. Isaacs, and W. Witt. 1981. Ornamental corn production in Kentucky. Univ. Ky. Ext. Publ. HO-81.
 SAS Institute Inc. 1989. SAS/STAT user's guide. v. 6. 4th ed. vol 2. SAS Inst., Cary, N.C.



Fig. 7. Composite of all 22 ornamental corn cultivars evaluated in 1998 at the Horticulture Research Farm, Rock Springs, Pa.