

Agronomy
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CORN HYBRID PERFORMANCE IN MARYLAND

The 1999 field corn hybrid trials were conducted by the Maryland Agricultural Experiment Station and the Department of Natural Resource Sciences and Landscape Architecture at four locations across Maryland: (1) Lower Eastern Shore Research and Education Center (REC) Poplar Hill Facility near Quantico in Wicomico County; (2) Wye REC at Queenstown in Queen Anne's County; (3) Central Maryland REC's Clarksville Facility in Howard County; and (4) Western Maryland REC's Keedysville Facility in Washington County. Entries in the tests were solicited from seed companies offering corn hybrids for sale in Maryland. Fifty-eight hybrids were entered in the field corn hybrid trials.

Corn hybrids were planted in a randomized complete block design, replicated three times at each location. Each entry was planted in four-row plots approximately 25 feet long with 30-inch row spacing using a Wintersteiger Plotking 2600 precision-spaced air planter. The seeding rate was 26,500 seeds per acre. Tillage varied according to location. Plantings began on April 21 at the Wye REC and were completed on May 17 at Keedysville. Plots were harvested with a Massey-Ferguson 8-XP combine.

Extreme weather conditions characterized the 1999-growing season. Severe drought conditions forced the state to implement water use restrictions in June. At the end of the growing season the state experienced major storm damage due to a series of hurricanes especially Floyd in mid-September. Due to wind damage no harvest data was collected at the Wye REC.

MEASUREMENTS AND RECORDS

Plant population, lodging, grain yield, and percent moisture were determined for each plot at each test site. Plant population was counted from July 10 to October 8. Lodging, defined as plants with stalks broken below the ear or leaning more than 45°, was measured on the day of harvest. A HarvestMaster HM-420 BF attached to the combine reported test plot weights and percent moisture. Grain yields were adjusted to 15.5% moisture and reported at 56 lb./bu.

Information regarding modified growing degree-days (MGDD) was provided by the seed company and was not determined from the Maryland corn hybrid trials. The following formula is used to calculate MGDD's:

$$\text{MGDD} = [(T_{\text{max}} + T_{\text{min}}) / 2] - T_b$$

Where T_{max} is the maximum daily temperature (with an upper limit of 86° F), T_{min} is the minimum daily temperature (with a lower limit of 50° F), and T_b is the base temperature equal to 50° F. The formula gives a linear function of how corn grows and accumulates days from time of planting until physiological maturity.

In the tables, an asterisk (*) indicates that the seed company highly recommends the hybrid for whole plant silage production.

Planting and harvesting dates, chemical usage and other information about the trials are given in Table 1. Growing season rainfall at each location is given in Table 2. Results of the trials by location and maturity grouping are given in Tables 3-11. A summary of the trials using relative yields is given in Tables 12-14. Relative yields are based on the average yield of all entries by maturity group and location. The companies that participated in the 1999 trials are listed in Table 15.

Data was statistically analyzed to determine if differences existed between hybrids at each location. At the bottom of Tables 3-11 a location mean, an LSD, and a CV are reported. Least significant differences (LSD) were calculated at the 25% probability level. Therefore, for two hybrids to be statistically different for a particular variable, they must have measured differences equal or greater than the LSD value for that variable. The coefficient of variation (CV) indicates the degree of precision with which the treatments are compared and is a good index of the reliability of the experiment. CV's below 15% are an indication that the precision of the test is good in distinguishing differences between hybrids.

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ADDITIONAL INFORMATION

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Table 1. 1999 Corn Hybrid trial plot information

Lower Eastern Shore REC's Poplar Hill Facility
Wicomico County---Quantico, Maryland

Soil Type:	Mattapex silt loam
Previous crop:	Wheat and double-cropped no-till soybeans
Fertilizer:	Through planter: 30-30-40-24 lb. N-P ₂ O ₅ -K ₂ O-S/acre Limed fall 1998 Sidedressed with 90 lb. Dribb four weeks after planting.
Herbicides:	Pre-emergent: 1.4 lb./acre Atrazine, 1 quart/acre Dual Post: 2, 4-D 8oz/acre + Accent
Insecticides:	None
Tillage:	Minimum
Planted:	April 26, 1999
Harvested:	October 8, 1999

Table 1, continued.

Central Maryland REC's Clarksville Facility
Howard County---Clarksville, Maryland

Soil Type:	Delanco silt loam
Previous crops:	Full season soybeans
Fertilizer:	178.75 lb. N/acre as 30% UAN applied on May 12, 1999, mixed with herbicides
Herbicides:	Pre-emergent (May 12, 1999): Bicep II magnum @ 2qt/acre; Gramoxone Extra @1pt/acre; Induce (surfactant) @1pt/acre Post (June 9, 1999): Marksman 3.2L @2pt/acre
Insecticides:	None
Tillage:	Minimum-tilled (Disked twice, Roller-harrowed once)
Planted:	May 10, 1999
Harvested:	November 5, 1999

Table 1, continued.

Western Maryland REC's Keedysville Facility
Washington County---Keedysville, Maryland

Soil Type: Hagerstown silt loam

Previous crops: Soybeans

Fertilizer: 130 lb. N/acre applied as urea on April 27, 1999

Herbicides: Pre-emergent (May 18, 1999): Atrazine @ 2qt/acre; Dual II @ 2pt/acre.
Post (June 11, 1999): Exceed @28 grams/acre; Banvel @ 4oz/acre

Tillage: Conventional

Planted: May 17, 1999

Harvested: October 27, 1999

Table 2. Growing Season Rainfall (inches)

	Poplar Hill	Clarksville	Keedysville
April	2.33	2.00	2.61
May	0.47	1.39	1.82
June	0.03	2.11	3.74
July	4.72	1.44	2.38
August	3.79	4.31	2.83
September	8.92	10.1	8.44
October	3.62	2.75	2.52
Totals	23.9	24.1	24.3

Table 3. 1999 Maryland field corn hybrid trial results at Poplar Hill: early-maturity group.

Brand	Hybrid	Bu/acre at 15.5%Moisture	%Moisture at harvest	MGDD's	Lodging at harvest	Plants/acre
Augusta	285	171	17	2550	2	22884
Augusta	3383	148	17	2570	8	22884
Augusta	6462	157	19	2550	3	24742
Augusta	6485	137	18	2530	4	22419
Augusta	9862	163	18	2525	7	22767
Augusta	9873	148	16	2490	4	23232
Augusta	9884	152	17	2530	4	21490
Cargill	6888	137	16	2485	8	22651
Cargill	7770	172	17	2600	3	24394
DeKalb	DK567	139	16	2650	8	21606
DeKalb	DK585	160	16	2720	8	22535
Doebler's	639XYG	168	16	2550	1	24045
Doebler's	642XP	160	17	2600	9	22419
Garst	8464	123	18	2570	9	21722
Garst	85411T	151	17	2560	7	23697
Mid-Atlantic	MA9010	136	16	2450	8	20909
Mid-Atlantic	MA9051	148	16	2370	3	23232
NC+	4880	137	17	2430	6	22419
NC+	5778	165	17	2510	1	24510
NC+	6868	178	18	2570	5	22884
NC+	5588B	167	17	2520	2	22419
Southern States	EXP77095	192	15	2550	8	23697
Grand Mean		155	17	NA	5	22889

LSD .25 = 10.25 bushels; CV = 7%

Table 4. 1999 Maryland filed corn hybrid trial results at Popular Hill: mid-maturity group.

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	% Lodging at harvest	Plants/acre
Agway	AG6191	160	16	2775	2	23116
Agway	AG657	148	16	2700	2	22767
Agway	AG657BT	161	17	2750	2	23348
Augusta	2062	152	19	2062	16	22128
Cargill	7512	173	18	2630	7	24974
Cargill	8412	175	20	2720	10	23697
Clark Seed	CL794	171	17	2750	1	23000
DeKalb	DK617	148	16	2750	6	22070
DeKalb	DK635	155	16	2800	4	24277
Doebler's	765XYG	155	18	2720	2	22651
Doebler's	851XY	168	18	2750	6	23000
Garst	8220	172	20	2690	15	22187
Garst	8285	179	17	2670	4	24277
NK	N70D5	168	17	2720	10	24510
NK	NX5867	148	16	2660	1	23464
NK	NX6567	148	16	2690	2	23232
Mid-Atlantic	MA9171	184	18	2750	9	23116
Mycogen	2725	158	17	2700	5	23464
Mycogen	2799	170	18	2745	3	24161
Pioneer	33K81	161	18	2710	1	23348
Seedway	E748	137	17	2625	17	20038
Seedway	E774	173	17	2650	5	22535
Southern States	729CL	168	17	2740	5	22651
Grand Mean		162	17	NA	6	23131

LSD .25 = 13 bushels; CV = 8%

Table 5. 1999 Maryland field corn trial results at Poplar Hill: full-maturity group.

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	% Lodging at harvest	Plants/acre
Agway	AG6399BT	187	17	2825	14	23116
Agway	AG795	151	18	2900	3	22651
Agway	AG795BT	171	18	2925	1	23929
Clark Seed	CL789	177	17	2850	2	23348
Clark Seed	CL797	177	19	2950	6	23464
Doebler's	82XP	187	18	2850	3	24858
Doebler's	859XY	163	19	2900	8	22187
NK	NX8308*	175	19	2830	1	23813
Mycogen	2888IMI	163	19	2860	12	24510
Southern States	769Bt	167	18	2820	0	23348
Southern States	849CL	190	19	2890	11	23813
Southern States	859CL	181	20	2910	15	23232
Southern States	EXP78469	167	20	2820	6	23232
Grand Mean		174	18	NA	6	23500

LSD .25 = 12 bushels; CV = 7%

Table 6. 1999 Maryland field corn hybrid trial results at Clarksville: early-maturity group

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	% Lodging at harvest	Plants/acre
Augusta	285	115	16	2550	14	21373
Augusta	3383	125	16	2570	15	22303
Augusta	6462	138	17	2550	18	23000
Augusta	6485	125	15	2530	18	21954
Augusta	9862	123	16	2525	21	18818
Augusta	9873	118	14	2490	31	21838
Augusta	9884	130	17	2530	38	22419
Cargill	6888	91	15	2485	16	20909
Cargill	7770	115	17	2600	12	21373
DeKalb	DK567	115	15	2650	33	21373
DeKalb	DK585	116	12	2720	44	24510
Doebler's	639XYG	119	15	2550	39	23813
Doebler's	642XP	125	16	2600	12	23116
Garst	8464	118	15	2570	9	22070
Garst	85411T	138	15	2560	11	22767
Mid-Atlantic	MA9010	94	14	2450	54	21954
Mid-Atlantic	MA9051	102	14	2370	39	24510
NC+	4880	102	15	2430	21	23000
NC+	5778	144	17	2510	13	23232
NC+	6868	124	19	2570	24	22767
NC+	5588B	135	16	2520	12	23580
Southern States	EXP77095	128	13	2550	39	24045
Grand Mean		120	15	NA	24	22488

LSD .25 = 22 bushels; CV = 19%

Table 7. 1999 Maryland field corn hybrid trial results at Clarksville: mid-maturity group.

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	% Lodging at harvest	Plants/acre
Agway	AG6191	132	15	2775	12	23580
Agway	AG657	108	15	2700	51	23116
Agway	AG657BT	137	15	2750	21	22419
Augusta	2062	112	17	2062	28	22884
Cargill	7512	132	19	2630	21	23348
Cargill	8412	130	18	2720	28	23580
Clark Seed	CL794	129	16	2750	9	18586
DeKalb	DK617	120	14	2750	18	22767
DeKalb	DK635	117	16	2800	21	21606
Doebler's	765XYG	101	16	2720	46	23348
Doebler's	851XY	141	17	2750	16	22303
Garst	8220	141	20	2690	12	22070
Garst	8285	140	17	2670	15	22535
NK	N70D5	138	16	2720	28	24045
NK	NX5867*	136	15	2660	23	23232
NK	NX6567	105	15	2690	47	23580
Mid-Atlantic	MA9171	137	18	2750	18	21954
Mycogen	2725	104	15	2700	15	23697
Mycogen	2799	132	16	2745	5	22070
Pioneer	33K81	131	17	2710	16	21141
Seedway	E748	111	16	2625	33	22651
Seedway	E774	125	16	2650	9	20328
Southern States	729CL	143	16	2740	14	23232
Grand Mean		125	16	NA	22	22525

LSD .25 = 30 bushels; CV = 16%

Table 8. 1999 Maryland field corn hybrid trial results at Clarksville: full- maturity group.

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MDGG's	% Lodging at harvest	Plants/acre
Agway	AG6399BT	152	17	2825	39	23813
Agway	AG795	132	16	2900	13	22419
Agway	AG795BT	130	17	2925	37	22419
Clark Seed	CL789	131	17	2850	9	23000
Clark Seed	CL797	123	17	2950	17	22303
Doebler's	82XP	132	17	2850	13	23116
Doebler's	859XY	140	19	2900	23	21141
NK	NX8308*	151	19	2830	30	23348
Mycogen	2888IMI	144	18	2860	23	23232
Southern States	769Bt	125	19	2820	11	24974
Southern States	849CL	115	20	2890	35	23232
Southern States	859CL	111	19	2910	23	23697
Southern States	EXP78469	94	19	2820	37	23348
Grand Means		129	18	NA	24	23080

LSD .25 = 55 bushels; CV = 27%

Table 9. 1999 Maryland field corn hybrid trial results at Keedysville: early-maturity group.

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	% Lodging at harvest	Plants/acre
Augusta	285	122	19	2550	22	22767
Augusta	3383	149	18	2570	31	22535
Augusta	6462	139	20	2550	21	23580
Augusta	6485	119	18	2530	13	22884
Augusta	9862	135	18	2525	18	21954
Augusta	9873	138	15	2490	25	22884
Augusta	9884	146	17	2530	27	22651
Cargill	6888	108	17	2485	22	22070
Cargill	7770	126	19	2600	30	22419
DeKalb	DK567	106	16	2650	34	24161
DeKalb	DK585	112	15	2720	38	23813
Doebler's	639XYG	118	17	2550	14	22070
Doebler's	642XP	154	18	2600	15	21838
Garst	8464	137	18	2570	15	23232
Garst	85411T	131	18	2560	22	24277
Mid-Atlantic	MA9010	139	17	2450	31	23348
Mid-Atlantic	MA9051	116	16	2370	35	21722
NC+	4880	118	17	2430	14	24510
NC+	5778	120	19	2510	28	23348
NC+	6868	118	19	2570	41	23464
NC+	5588B	109	20	2520	10	23464
Southern States	EXP77095	90	15	2550	40	23813
Grand Means		125	18	NA	25	23037

LSD .25 = 37 bushels; CV = 31%

Table 10. 1999 Maryland field corn hybrid trial results at Keedysville: mid-maturity group.

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	% Lodging at harvest	Plants/acre
Agway	AG6191	129	16	2775	26	24045
Agway	AG657	152	16	2700	16	24045
Agway	AG657BT	161	17	2750	14	23464
Augusta	2062	134	20	2062	28	23464
Cargill	7512	113	18	2630	29	23929
Cargill	8412	140	20	2720	40	22884
Clark Seed	CL794	140	21	2750	15	23580
DeKalb	DK617	133	15	2750	19	24742
DeKalb	DK635	121	18	2800	23	22651
Doebler's	765XYG	148	19	2720	22	23929
Doebler's	851XY	108	17	2750	40	21722
Garst	8220	123	22	2690	27	22651
Garst	8285	159	20	2670	16	25323
NK	N70D5	157	18	2720	27	23697
NK	NX5867*	152	17	2660	4	23116
NK	NX6567	154	18	2690	14	24394
Mid-Atlantic	MA9171	140	20	2750	32	23464
Mycogen	2725	111	18	2700	15	25207
Mycogen	2799	182	18	2745	3	24045
Pioneer	33K81	155	18	2710	40	25091
Seedway	E748	133	19	2625	31	22187
Seedway	E774	151	19	2650	20	21838
Southern States	729CL	140	17	2740	27	21606
Grand Mean		141	18	NA	23	23525

LSD .25 = 42 bushels; CV = 31%

Table 11. 1999 Maryland field corn hybrid trial results at Keedysville: full-maturity group.

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	% Lodging at harvest	Plants/acre
Agway	AG6399BT	164	19	2825	26	23348
Agway	AG795	122	20	2900	31	24161
Agway	AG795BT	146	21	2925	15	23464
Clark Seed	CL789	129	20	2850	19	24277
Clark Seed	CL797	116	20	2950	26	22651
Doebler's	82XP	127	19	2850	9	23000
Doebler's	859XY	141	19	2900	24	22884
NK	NX8308*	176	22	2830	16	24858
Mycogen	2888IMI	145	20	2860	27	24394
Southern States	769Bt	170	21	2820	3	23697
Southern States	849CL	119	20	2890	24	22651
Southern States	859CL	113	20	2910	27	23580
Southern States	EXP78469	116	22	2820	23	21606
Grand Mean		137	20	NA	21	23429

LSD .25 = 36 bushels; CV = 25%

Table 12. Summary of 1999 Maryland field corn hybrid trial results: early-maturity group. (% relative yield)

Brand	Hybrid	Poplar Hill	Clarksville	Keedysville
Augusta	285	110	96	98
Augusta	3383	95	104	119
Augusta	6462	101	115	111
Augusta	6485	88	104	95
Augusta	9862	105	103	108
Augusta	9873	95	98	110
Augusta	9884	98	108	117
Cargill	6888	88	76	86
Cargill	7770	111	96	101
DeKalb	DK567	90	96	85
DeKalb	DK585	103	97	90
Doebler's	639XYG	108	99	94
Doebler's	642XP	103	104	123
Garst	8464	79	98	110
Garst	85411T	97	115	105
Mid-Atlantic	MA9010	88	78	111
Mid-Atlantic	MA9051	95	85	93
NC+	4880	88	85	94
NC+	5778	106	120	96
NC+	6868	115	103	94
NC+	5588B	108	113	87
Southern States	EXP77095	124	107	72
Grand Mean		100	100	100

Table 13. Summary of 1999 Maryland field corn hybrid trial results: mid-maturity group. (% relative yield)

Brand	Hybrid	Poplar Hill	Clarksville	Keedysville
Agway	AG6191	99	105	91
Agway	AG657	91	86	108
Agway	AG657BT	99	109	114
Augusta	2062	94	89	95
Cargill	7512	107	105	80
Cargill	8412	108	103	99
Clark Seed	CL794	106	102	99
DeKalb	DK617	91	95	94
DeKalb	DK635	97	93	86
Doebler's	765XYG	97	80	105
Doebler's	851XY	104	112	77
Garst	8220	106	112	87
Garst	8285	110	111	113
NK	N70D5	104	110	111
NK	NX5867*	91	108	108
NK	NX6567	91	83	109
Mid-Atlantic	MA9171	114	109	99
Mycogen	2725	98	83	79
Mycogen	2799	105	105	129
Pioneer	33K81	99	104	110
Seedway	E748	85	88	94
Seedway	E774	107	99	107
Southern States	729CL	104	113	99
Grand Mean		100	100	100

Table 14. Summary of 1999 Maryland field corn trial results: full- maturity group. (% relative yield)

Brand	Hybrid	Poplar Hill	Clarksville	Keedysville
Agway	AG6399BT	107	118	120
Agway	AG795	87	102	89
Agway	AG795BT	98	101	107
Clark Seed	CL789	102	101	94
Clark Seed	CL797	102	95	85
Doebler's	82XP	107	102	93
Doebler's	859XY	94	109	103
NK	NX8308*	101	117	128
Mycogen	2888IMI	94	88	106
Southern States	769Bt	96	97	124
Southern States	849CL	109	89	87
Southern States	859CL	104	86	82
Southern States	EXP78469	96	73	85
Grand Mean		100	100	100

Table 15. Participating companies in the 1998 Maryland field hybrid trials.

Brand	Address
Agway	Agway Farm Seeds, 6835 Tully-Truxton Rd, Tully, NY 13159
Augusta	Augusta Seed, 106 Fairburn Rd., Mt. Solon, VA 22843
Cargill	Cargill Hybrid Seeds, PO Box 5645, Minneapolis, MN 55440
Clark's	Clark Seed Inc., PO Box 219, Kenton DE 19955
DeKalb	Monsanto, 3100 Sycamore Road, DeKalb, IL 60115
Doebler's	Doebler's PA Hybrids, Inc., RR 1, Box 424, Jersey Shore, PA 17740
Garst	Garst Seed Company, PO Box 500, Slater, IA 50244
Mid-Atlantic	Mid-Atlantic Seed, 2083 Springwood Road #163, York, PA 17403
Mycogen	Mycogen Seeds, 1340 Corporate Center Curve, Eagan, MN 55121
NC+	NC+ Hybrids, PO Box 4408, Lincoln, NE 68504
NK	Hoffman Seeds Inc., 167 Greenfield Road, Lancaster, PA 17605
Pioneer	Pioneer Hi-Bred, PO Box 280, Mount Joy, PA 17552
Seedway	Seedway, 1734 Railroad Place, Hall, NY 14463
Southern States	Southern States, PO Box 26234, Richmond, VA 23260