

Agronomy
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Bt CORN HYBRID PERFORMANCE IN MARYLAND

The 1999 Maryland *Bacillus thuringiensis* (Bt) corn hybrid trials were conducted by the Central Maryland Research and Education Center (REC) Beltsville Facility in Prince George's County, the Wye Research and Education Center (REC) at Queenstown in Queen Anne's County, and the Department of Natural Resource Sciences and Landscape Architecture. Entries in the tests were solicited from seed companies offering corn hybrids for sale in Maryland. Twenty-two Bt corn hybrids were entered in the field corn hybrid trials.

Bt 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 were on April 21 at the Wye REC and on May 3 at Beltsville. 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 the study was hand harvested 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 populations were counted on July 10 at Wye and July 23 at Beltsville. Lodging data was not available at either site due to wind damage from hurricane Floyd in mid-September. 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 are given in Tables 3 and 4. The companies that participated in the 1999 trials are listed in Table 5.

Data was statistically analyzed to determine if differences existed between hybrids at each location. At the bottom of Tables 3-11 a location mean, 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

Proper citation of this update is: Grant, K.G. 1999 Bt corn hybrid performance in Maryland. University of Maryland, Department of Natural Resource Sciences and Landscape Architecture, Maryland Cooperative Extension, Agronomy Update No. 112. Agronomy Update No. 112 can be downloaded from the Maryland Cropping Systems webpage: <http://www.agnr.umd.edu/users/nrsl/crops>.

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Table 1. 1999 Bt corn hybrid trial plot information

Central Maryland Research and Education Center's Beltsville Facility
Prince George's County, Maryland

Soil Type:	Keyport Fine Sandy Loam
Previous Crop:	Wheat
Fertilizer:	25 lb. N with herbicide Sidedressed with 115 lb. N three weeks after planting.
Herbicides:	Pre-emergent--2pt/acre Dual II, 1.65 lbs./acre Atrazine 90DF Post-- 1 pt/acre Tough, 1 qt/acre Aatrex 4L, 1 qt/acre crop oil
Insecticides:	None
Tillage:	Chisel plowed
Planted:	May 3, 1999
Harvested:	October 14, 1999

Table 1, continued.

Eastern Maryland Research and Education Center's Wye Facility
Queen Anne's County, Maryland

Soil type:	Mattapeake silt loam
Previous crop:	Soybeans
Fertilizer:	Broadcast 315 lb./acre 16-8-8 N-P ₂ O ₅ -K ₂ O on April 20, 1999 Sidedress with 120 lb./acre N as 30% UAN on June 2, 1999
Herbicides:	Pre-emergent--1.75 qt/acre Bicep II Magnum
Insecticides:	6 oz/acre Pounce
Tillage:	Conventional
Planted:	April 21, 1999
Harvested:	September 25, 1999

Table 2. Growing Season Rainfall (inches)

	Wye	Hayden
April	1.83	2.08
May	0.48	0.98
June	3.33	2.72
July	4.09	0.72
August	8.42	5.67
September	13.4	11.2
October	3.11	2.48
Totals	34.7	25.8

Table 3. 1999 Maryland Bt field corn hybrid trials at Beltsville

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	Plants/acre
Cargill	6521Bt	72	14	2540	23580
Cargill	7821Bt	75	18	2620	20328
Clark Seed	CL813Bt	93	18	2750	21141
Clark Seed	CL816Bt	67	20	2850	18237
DeKalb	DK589Bty	52	14	2720	24626
DeKalb	DK595Bty	86	17	2720	10803
DeKalb	DK626Bty	78	15	2800	22419
DeKalb	DK679Bty	34	19	2885	20793
Doebler's	639XYG	89	16	2550	20793
Doebler's	765XYG	69	17	2720	21954
Garst	8342GLS/Bt/IT	84	17	2610	21490
Garst	8366Bt/LL	55	16	2580	13126
Garst	8550Bt	82	15	2555	22767
Garst	8585GLS/BLT	76	17	2555	19747
MidAtlantic	MA9111YG	77	15	2525	19283
MidAtlantic	MA9121YG	76	15	2550	23116
MidAtlantic	MA9140YG	64	18	NA	22303
MidAtlantic	MA9163YG	64	19	2775	12778
Pioneer	33P67	79	16	2740	22651
Pioneer	33Y09	94	17	2740	21257
Southern States	769Bt	63	19	2820	23697
Southern States	EXP79027	47	17	2870	23232
Grand Mean		71	17	NA	20227

LSD .25 = 22 bushels: CV = 32%

Table 4. 1999 Maryland Bt field corn hybrid trials at Wye

Brand	Hybrid	Bu/acre at 15.5% Moisture	%Moisture at harvest	MGDD's	Plants/acre
Cargill	6521Bt	147	16	2540	23174
Cargill	7821Bt	162	20	2620	24045
Clark Seed	CL813Bt	134	17	2750	24045
Clark Seed	CL816Bt	136	20	2850	23697
DeKalb	DK589Bty	125	16	2720	24394
DeKalb	DK595Bty	153	17	2720	23522
DeKalb	DK626Bty	134	17	2800	24045
DeKalb	DK679Bty	149	19	2885	23871
Doebler's	639XYG	119	16	2550	21780
Doebler's	765XYG	142	18	2720	22825
Garst	8342GLS/Bt/IT	153	19	2610	23348
Garst	8366Bt/LL	152	19	2580	21432
Garst	8550Bt	124	17	2555	23000
Garst	8585GLS/BLT	100	15	2555	19689
MidAtlantic	MA9111YG	142	18	2525	24394
MidAtlantic	MA9121YG	141	20	2550	21954
MidAtlantic	MA9140YG	143	18	NA	23348
MidAtlantic	MA9163YG	150	20	2775	23348
Pioneer	33P67	160	20	2740	22477
Pioneer	33Y09	145	19	2740	23174
Southern States	769Bt	137	19	2820	23348
Southern States	EXP79027	136	21	2870	22825
Grand Mean		140	18	NA	23079

LSD .25 = 15 bushels: CV = 9%

Table 5. Participating companies in the 1998 Maryland Bt field hybrid trials.

Brand	Address
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
Pioneer	Pioneer Hi-Bred, PO Box 280, Mount Joy, PA 17552
Southern States	Southern States, PO Box 26234, Richmond, VA 23260