

1998 Bt Corn Hybrid Performance in Maryland

The 1998 Maryland *Bacillus thuringiensis* (Bt) corn hybrid trials were conducted by the Central Maryland Research and Education Center Beltsville Facility in Prince George's County, the Wye Research and Education Center at Queenstown in Queen Anne's County, and the Department of Natural Resource Science and Landscape Architecture. Entries in the tests were solicited from seed companies offering Bt corn hybrids for sale in Maryland. Eleven hybrids were planted at Beltsville, and nine hybrids were planted at Wye.

Bt corn hybrids were planted in a randomized complete block design with four replications. Each entry was planted in four-row plots twenty-five feet long with thirty-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 30 at the Wye REC and on May 18 at Beltsville. Plots were harvested with a Massey-Ferguson 8-XP combine.

Very dry conditions characterized the 1998 growing season. Precipitation from May through September was lower than the thirty-year average at the Beltsville and Wye locations by 7.1 and 8.2 inches, respectively. Precipitation and temperatures at the trial locations are given in Figures 1-4. All thirty-year weather data were taken from Owenby and Ezell's *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961-1990—Maryland* (National Climatic Data Center, Asheville, N.C.).

MEASUREMENTS AND RECORDS

Plant population, lodging, grain yield, and percent moisture were determined for each plot at each test site. Plant population was determined on June 30 at Wye and July 6 at Beltsville. Lodging, defined as plants with stalks broken below the ear or leaning more than 45°, was determined 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 Bt corn hybrid trials. The following formula is used to calculate MGDD's:

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

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.

Planting and harvesting dates, chemical usage, and other information about the trials is given in Table 1. Results of the trials are given in Tables 2 and 3. The companies that participated in the 1998 Bt corn trials are listed in Table 4.

Data were statistically analyzed to determine if differences existed between hybrids at each location. At the bottom of each table a location mean, a 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 any 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.

ACKNOWLEDGEMENTS

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ADDITIONAL INFORMATION

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Table 1. 1998 Bt corn hybrid trial plot information.

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

Soil type: Sassafras Sandy Loam
Previous crop: Soybeans
Fertilizer: 25 lb/acre N on May 20, 1998
 115 lb/acre N on June 4, 1998
Herbicides: 1.5 qt/acre Roundup Ultra, 1.65 lb/acre Atrazine 90 DF, 2 lb/acre Bladex 90
 DF, and 2 pt/acre Dual 8E on May 20, 1998
Insecticides: None
Tillage: Chisel plowed on April 10, 1998
 Disked on April 20, 1998
 Landsman on April 22, 1998
Planted: May 18, 1998
Harvested: September 25, 1998

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

Soil type: Matapeake silt loam
Previous crop: Soybeans
Fertilizer: Broadcast 150 lb/acre 0-0-41 N-P₂O₅-K₂O on April 28, 1998
 40 lb N/acre as 30% UAN applied on May 6, 1998
 Sidedressed with 133 lb N/acre as 30% UAN on June 9, 1998
Herbicides: Pre-emergent—2.2 qt/acre Bicep II on May 1, 1998
Insecticides: 6 oz/acre Ambush applied with herbicide on May 1, 1998
Tillage: Conventional
Planted: April 30, 1998
Harvested: September 15, 1998

Table 2. 1998 Maryland *Bacillus thuringiensis* (Bt) field corn hybrid trial entries at Beltsville

Brand	Hybrid	Bu/acre at 15.5% Moisture	% Moisture at harvest	MGDD	% Lodging at harvest	Plants/acre
Cargill	7821 Bt	118	21	2700	1	25099
Mycogen	2801	89	22	2725	0	25099
NK	MAX 21	75	19	2620	1	23735
NK	MAX 496	92	20	2720	0	26099
NK	N 75-T2	105	20	2810	0	24826
NK	N 7639BT	75	21	2800	1	24553
Pioneer	33 A 14	62	19	2710	3	25372
Pioneer	33 Y 09	106	20	2740	1	25463
Southern States	78004	111	20	2710	0	23735
Terra	E 1058Bt	83	21	2450	1	26008
Terra	E 1166Bt	72	20	2700	1	24098
Grand Mean		90	20	NA	0.9	24917

LSD .25 = 21 bushels; CV = 20%

Table 3. 1998 Maryland *Bacillus thuringiensis* (Bt) field corn hybrid trial entries at Wye

Brand	Hybrid	Bu/acre at 15.5% Moisture	% Moisture at harvest	MGDD	% Lodging at harvest	Plants/acre
Cargill	7821 Bt	143	23	2700	0	24280
Mycogen	2801	140	18	2725	0	23644
NK	MAX 21	103	17	2620	0	24008
NK	MAX 496	126	19	2720	0	22734
NK	N 75-T2	124	20	2810	0	23098
NK	N 7639BT	141	21	2800	0	23098
Pioneer	33 A 14	163	22	2710	1	25372
Pioneer	33 Y 09	142	19	2740	0	24462
Southern States	78004	144	23	2710	0	23007
Grand Mean		136	20	NA	0.1	23745

LSD .25 = 16 bushels; CV = 12%

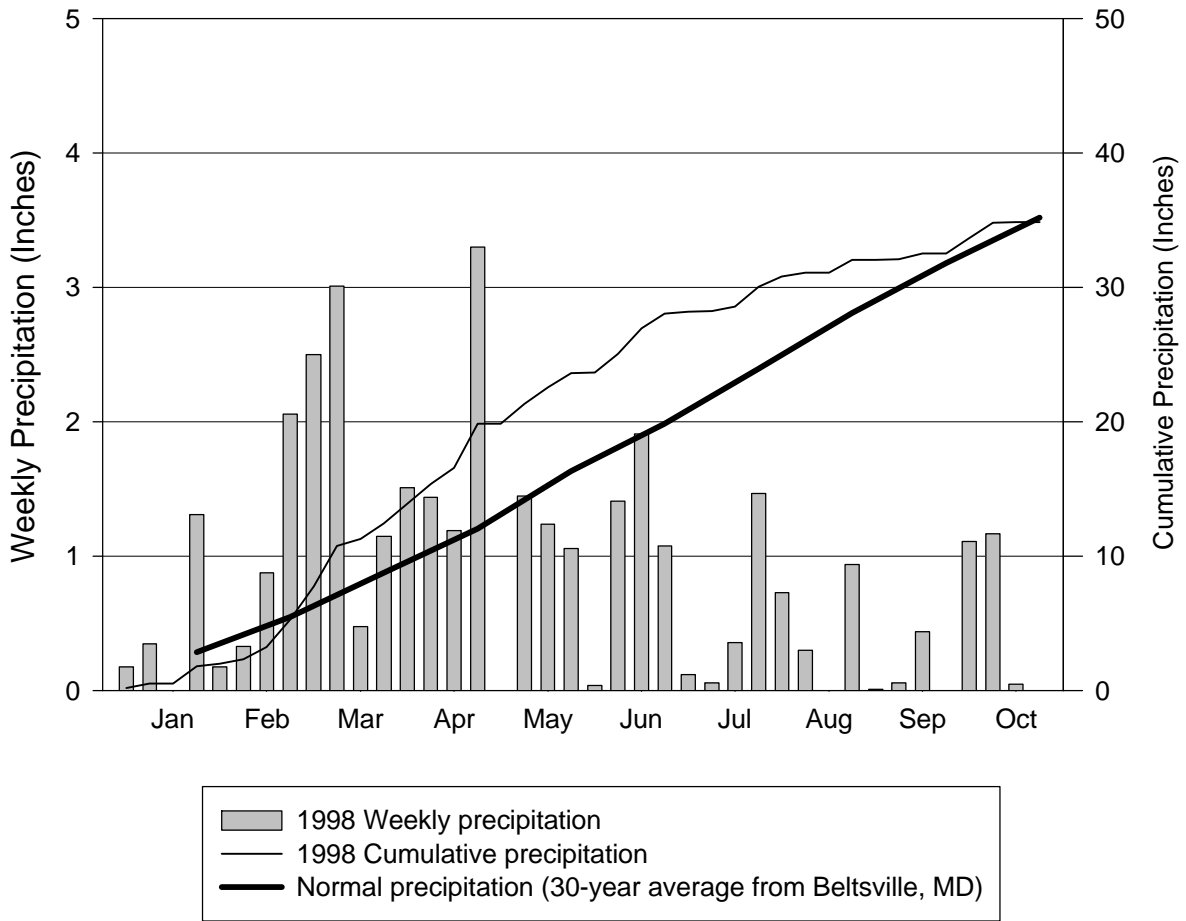


Figure 1. 1998 Precipitation at Beltsville.

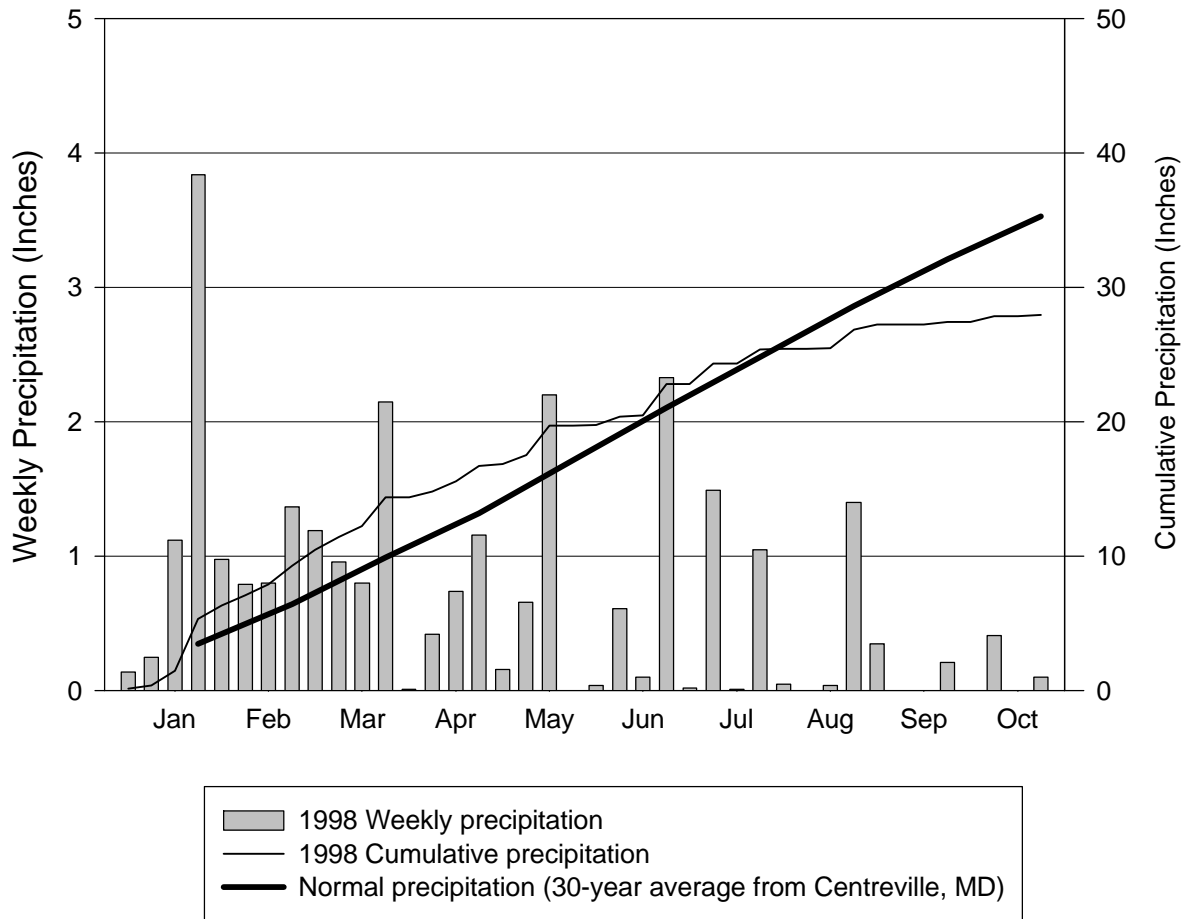


Figure 2. 1998 Precipitation at Wye.

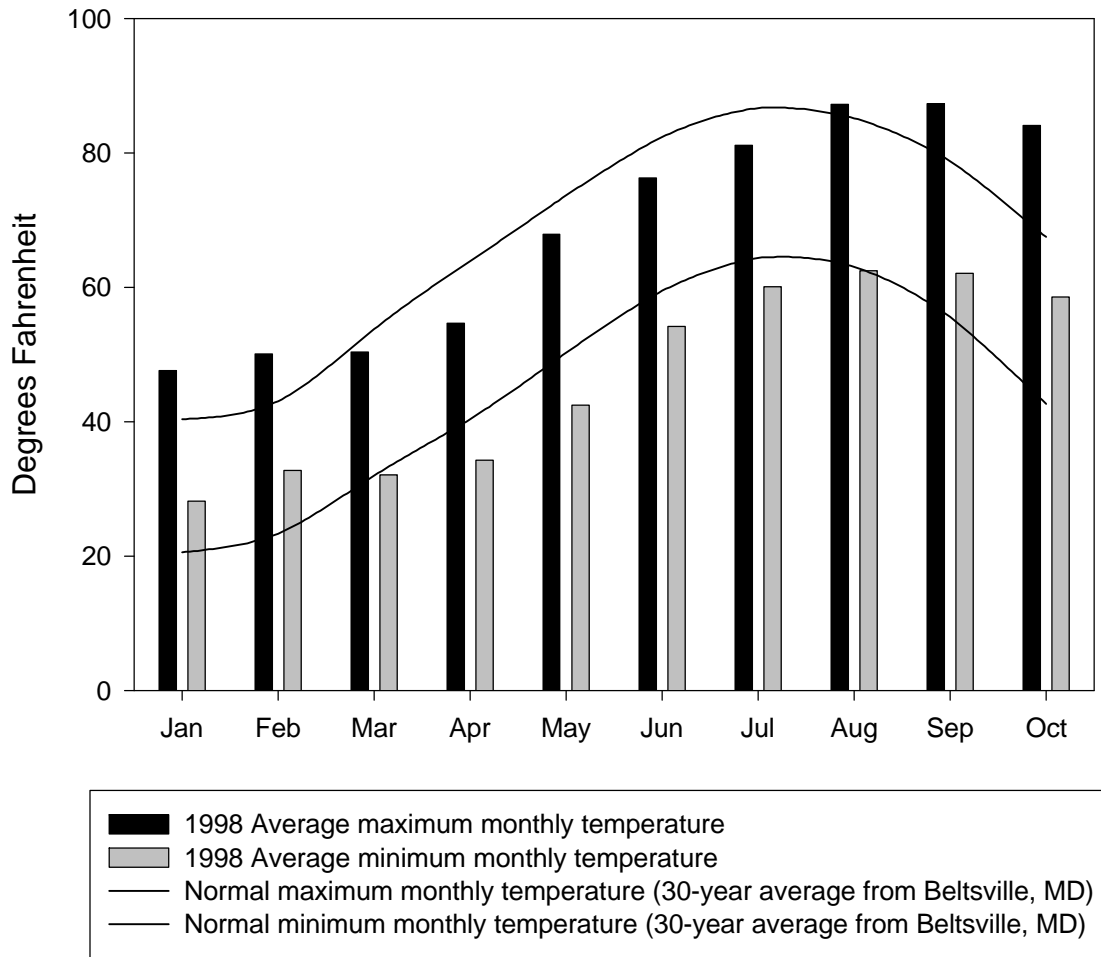


Figure 3. Beltsville temperatures

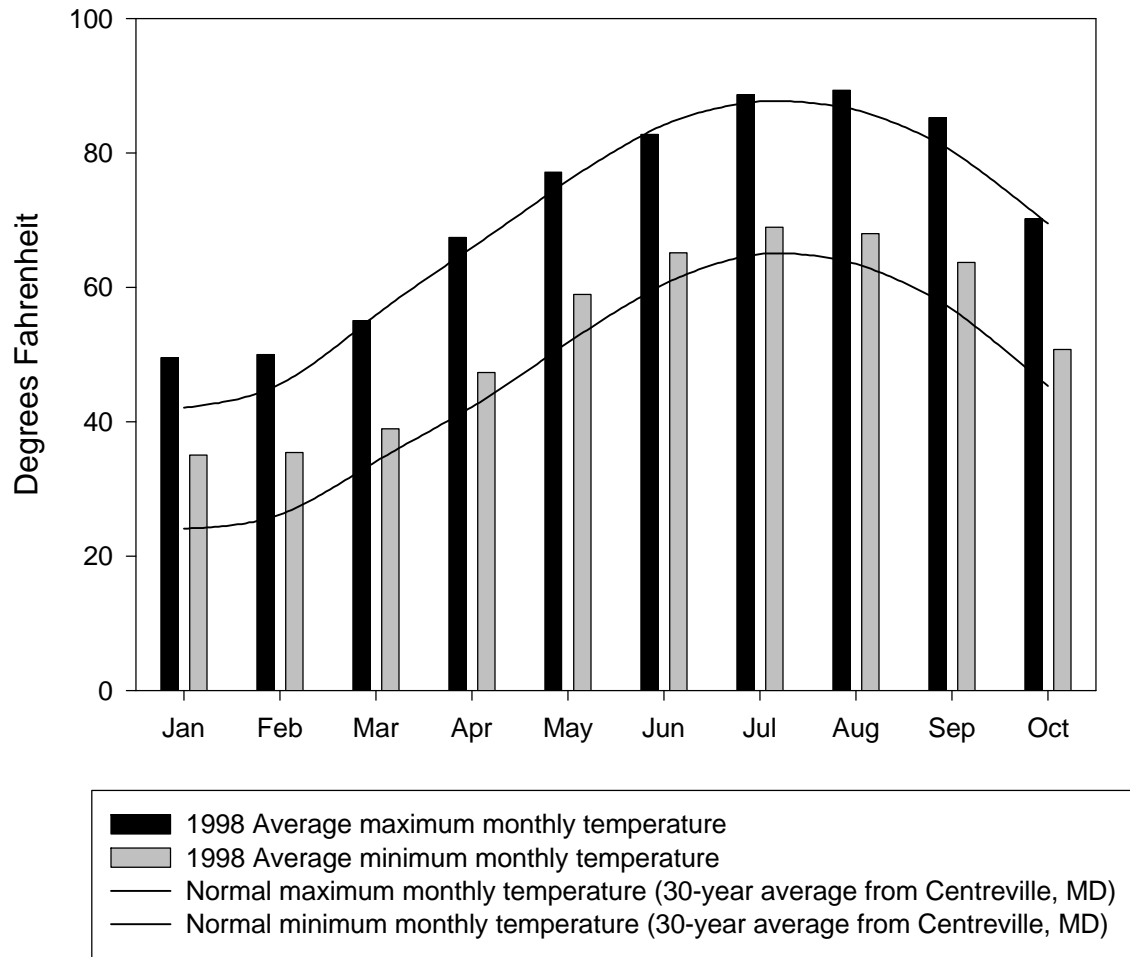


Figure 4. Wye Temperatures.

Table 4. Participating companies in the 1998 Maryland Bt corn hybrid trials.

Brand	Address
Cargill	Cargill Hybrid Seeds, P.O. Box 5645, Minneapolis, MN 55440
Mycogen	Mycogen Seeds, 1340 Corporate Center, P.O. Box 21428, St. Paul, MN 55121-1428
NK	Hoffman Seeds, Inc., 167 Greenfield Rd., P.O. Box 12400, Lancaster, PA 17605-2400
Pioneer	Pioneer Hi-Bred International, Inc., P.O. Box 280, Mount Joy, PA 17552
Southern States	Southern States Coop., Inc., W. Broad St., P.O. Box 26234, Richmond, VA 23260
Terra	600 4 th St. Sioux City IA 51102-6000