

## **DELAWARE HYBRID FIELD CORN PERFORMANCE TRIALS - 2011**

The 2011 Delaware hybrid field corn trials were conducted jointly by the University of Delaware's Agricultural Experiment Station and the Delaware Cooperative Extension Service, College of Agriculture and Natural Resources. Fifty-four hybrids were evaluated at four locations: Baker Farms at Middletown, DE (dryland); Dickerson Farms at Dover, DE (center pivot irrigation); Thomas Family Farm at Marydel, DE (center pivot irrigation); and Research & Education Center at Georgetown, DE (lateral move irrigation). Hybrids were divided into three maturity groups; early (13 entries), early-medium (23 entries), and medium/medium-late (18 entries). Plans and rules for entering these trials are available upon request.

### Methodology

A randomized complete block design with four replications was used in all tests. Four row plots were planted with a Monosem air planter. The center two rows of each plot were harvested with a small plot combine. Tillage and cultural practices are noted in Table 1. Weather information is summarized in Tables 2 and 3. Data were analyzed by analysis of variance and hybrids were ranked by yield in each test.

### Traits Measured

- Yield was recorded in bushels per acre on the basis of 56 lb/bu and adjusted to 15.5% moisture.
- % moisture is the actual percentage of grain harvest moisture determined by a grain analysis computer.
- Yield/moisture (Y/M) is the yield in bu/A (adjusted to 15.5% moisture) divided by the grain harvest moisture.
- Final population is the plant population per acre taken at flowering time.
- % stalk lodging is the percentage of stalks that were broken below the ear.
- % root lodging is the percentage of plants that had lodged more than 30 °.
- % ear drop is the percentage of ears found on the ground before harvesting.

### C.V. and L.S.D.

The coefficient of variation, or C.V., is a measurement of the amount of uncontrollable variability due to differences in the soil, weather, fertility, etc. C.V.'s below 15% are considered good. Please note that C.V.'s are expected to be higher at dryland locations particularly in drought years due to lower yields.

The least significant difference, or L.S.D., (computed at a 5% level of probability) is a tool to determine if two average values are significantly different. The difference between two hybrids must exceed the L.S.D. value to be considered significantly different. Example for yield: L.S.D. = 25 bu/A, hybrid X = 120 bu/A, hybrid Y = 150 bu/A. The difference between X and Y (30 bu/A) exceeds the L.S.D. (25 bu/A). Therefore, hybrid Y has a significantly higher yield performance than hybrid X.

### Note

When reviewing the enclosed data it is important to note moisture percentages when comparing hybrids within the same maturity. Comparisons should not be made between hybrids of different maturity groups since these are separate tests. These results are based on one year's data only and should be considered as preliminary results. Hybrid performance may vary from location to location and from year to year because of differences in rainfall, temperature, soil type, soil fertility, diseases, insects, and a variety of other factors. Growers will obtain the best estimate of individual hybrid performance by looking at performance data over several years and across locations. We have provided a column for each maturity group that calculates the average performance of hybrids over all locations.

### HOW TO BEST USE CORN HYBRID PERFORMANCE TRIAL INFORMATION:

Information presented in this summary may be useful in selecting corn hybrids for production in Delaware. To maximize the usefulness of this information, follow these suggestions:

1. Select the test location that best represents your production location(s). Generally, corn hybrids are widely adapted across Delaware but certain soil or climatic conditions, cultural practices, or insect/disease problems may limit the choice of an entry.
2. Multiple-year average (means) across the greatest number of years are the best predictors of performance. Refer

to previous test reports for information to evaluate corn hybrids which are of interest to you. Comparison between your selected hybrid and the grand mean for that maturity group will be helpful in identifying superior hybrids. When evaluating test results across years or locations, we recommend that you give preference to trials with coefficients of variation less than 15%. Growers should also consider the cultural practices used for each trial.

3. Check the grand mean for the long-term averages and compare with your own production experience. If your yields have been consistently below these grand mean levels, you should evaluate each part of your management system for potential areas of improvement.
4. Using long-term averages, select the hybrid or hybrids with which you are best acquainted or are currently using on your farm. Use these hybrids as “bench marks” when comparing new hybrids. Identify those hybrids which have over years produced yields higher than your selected bench mark hybrid. Hybrids with excessive ear drop and high lodging percentages should be avoided.

### Summary of Results

The 2011 growing season was characterized by a wet spring during planting followed by dry and hot conditions throughout June and July (Tables 2 and 3). Delaware grain corn yield in 2011 is expected to average 125 bu/A compared to 115 bu/A in 2010 (Delaware Agriculture Statistics Service). European corn borer incidence was very low across locations. We were not able to harvest Dickerson Farms at Dover, DE and Thomas Family Farm at Marydel, DE due to excessive stalk and root lodging as a result of hurricane Irene. Also as result of hurricane Irene we were not able to take stalk and root lodging information at the Research & Education center Georgetown location, but were able to harvest and get the yield data.

Yields at Middletown (Baker Farms) dryland no-till location were reduced due to insufficient rainfall and high heat with an average yield of 144, 155, and 163 bu/A for the early, early-medium, and medium/medium-late maturity groups, respectively. There were significant differences between hybrids in yield, moisture, yield/moisture, population, and root lodging across all maturity groups. Stalk lodging was significant only for the early-medium and medium/medium-late maturity groups.

Yields were lower than expected at the Sussex County site (Research & Education Center) due to high heat and

heavy stalk and root lodging as a result of hurricane Irene particularly for the medium/medium-late maturity group. The average yields for the early, early-medium, and medium/medium-late maturity groups were 195, 202, and 149 bu/A, respectively. There were significant differences between hybrids in yield, and population for the early maturity group. There was also significant difference in moisture for the medium/medium-late maturity group.

The grain yield rankings of hybrids across locations are provided in each table. A pooled yield average and yield ranks are also provided for each hybrid. There are a few hybrids that had high yield rankings across both locations. We encourage growers to give strong consideration to hybrids with high average performance across locations and years and to use such hybrids as benchmarks for future hybrid decisions. However, growers should recognize that the relative performance of some hybrids might differ across environments. Careful hybrid selection should help stabilize yield performance in Delaware.

TABLE 1. EXPERIMENTAL DETAILS AND CULTURAL PRACTICES.

	Baker Farms (Dryland)		Research & Education Center (Irrigated)
Number of entries	54		54
Number of maturities	3		3
Target Population plants/A	26,000		30,000
Row length	17.4'		17.4'
Number of rows harvested	2		2
Number of replications	4		4
Planting date	May 6		April 27
Harvest date	October 5		September 16
Soil type	Matapeake silt loam		Rosedale loamy sand
Previous crop	Soybean		Soybean
Cover crop	None		None
Tillage practices	No-till		Disked, ripped, field cultivator
Cultivation	None		None
Fertilization	12 gallons/A of 19-18-0 (N,P,K) corn starter (24lbs N, 23 lbs P) applied with planter. 10 gallons/A of 30% UAN (32 lbs. N) applied mixed with the pre-emergence herbicide, and 50 gallons/A nitrogen (160 lbs) side-dressed as 30% UAN solution at mid-whorl stage.		200 lbs/A 0-0-60 prior to planting. 12 gallons/A of 19-18-0 (N,P,K) corn starter (24lbs N, 23 lbs P) applied with planter, 10 gallons/A of 30% UAN (32 lbs N) applied mixed with the pre-emergence herbicide, and 60 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage.
Herbicides	3 quarts/A of Lexar + 1 qt/A Simazine, applied pre-emergence.		3 quarts/A of Lexar + 1 qt/A Simazine applied pre-emergence.
Insecticide	5.5 lb/A Force 3G in seed furrow		5.5 lb/A Force 3G in seed furrow
Irrigation	None		Lateral move

**TABLE 2. DAILY TEMPERATURE AT OR NEAREST TEST LOCATIONS FOR THE 2011 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRIALS DURING MAY AND JUNE.**

Date of Month	May				June			
	Georgetown		Townsend		Georgetown		Townsend	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	64.9	41.6	62.8	42.8	91.0	69.1	91.3	68.9
2	76.9	51.6	73.3	53.2	85.5	60.8	82.3	61.6
3	81.7	59.5	80.9	57.2	77.9	53.3	76.8	49.7
4	68.3	47.5	67.7	47.3	80.7	49.2	78.3	46.0
5	65.2	44.4	64.6	44.4	76.5	61.6	74.7	61.4
6	69.5	44.9	69.9	40.8	82.0	58.1	82.9	55.7
7	71.0	50.3	69.4	46.0	85.8	61.1	85.6	60.9
8	71.7	44.9	71.7	44.6	94.5	67.5	91.9	65.5
9	71.7	44.3	70.2	47.1	97.3	71.8	96.2	71.9
10	73.3	45.9	74.2	48.3	91.0	70.0	88.0	69.4
11	67.4	44.6	71.2	44.7	87.8	68.9	84.6	68.1
12	74.0	44.3	72.8	46.7	86.4	67.3	83.9	67.0
13	69.8	48.7	68.3	51.8	77.9	59.8	73.3	58.4
14	64.5	54.5	60.7	56.9	74.2	54.4	73.5	55.8
15	78.6	62.9	76.5	60.3	81.0	55.8	81.2	52.4
16	77.5	61.1	74.1	58.8	81.9	56.3	78.2	59.3
17	72.5	60.5	67.5	61.7	83.6	64.8	84.5	65.4
18	71.3	57.4	70.1	60.3	87.7	62.9	85.7	64.1
19	74.8	55.8	71.4	54.4	81.8	66.3	84.4	65.3
20	70.4	54.6	68.0	52.4	76.2	60.8	75.8	62.7
21	78.1	55.6	77.6	51.6	82.9	59.1	85.7	62.6
22	72.9	57.2	68.4	57.3	89.2	67.1	92.9	65.9
23	82.7	62.6	82.0	61.4	83.7	72.4	87.0	74.3
24	87.4	70.4	82.5	69.4	87.0	70.2	88.3	67.5
25	83.8	66.9	82.6	64.6	84.2	67.1	83.4	65.0
26	90.4	65.3	88.7	64.4	82.3	64.1	81.2	59.5
27	85.3	69.2	84.9	64.3	84.3	67.5	81.1	67.8
28	73.0	63.9	82.5	66.2	89.7	66.6	84.7	64.1
29	76.2	66.5	85.0	67.4	86.4	70.9	84.3	66.3
30	81.2	69.0	91.1	69.2	82.7	63.6	82.4	58.8
31	80.1	68.5	93.1	69.7				
AVG.	75.0	55.9	75.0	55.7	84.4	63.6	83.5	62.7

**TABLE 2. DAILY TEMPERATURE AT OR NEAREST TEST LOCATIONS FOR THE 2011 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRIALS**

DURING JULY AND AUGUST ( continued ).

Date of Month	July				August			
	Georgetown		Townsend		Georgetown		Townsend	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	86.4	58.4	83.6	58.0	93.3	71.4	92.0	71.2
2	88.9	58.4	88.6	58.5	88.5	68.1	87.4	69.9
3	88.8	70.1	88.2	70.7	81.4	70.6	80.0	70.4
4	90.1	70.5	87.7	69.9	79.1	65.0	76.1	68.5
5	89.9	70.9	90.4	67.9	82.9	61.1	82.1	62.3
6	86.4	66.8	88.8	70.3	86.3	63.6	87.4	68.7
7	92.7	69.0	95.1	68.6	88.1	75.0	88.6	74.9
8	87.8	70.2	87.3	69.9	91.1	72.0	87.1	71.9
9	87.2	69.9	87.3	68.3	92.1	68.0	87.7	68.7
10	90.2	63.7	89.6	64.0	87.9	65.4	84.5	67.1
11	89.8	67.0	90.5	69.3	86.0	62.2	81.1	61.2
12	90.5	74.5	90.9	73.2	86.9	57.7	82.4	58.4
13	90.0	70.4	87.6	70.3	83.2	60.4	83.4	57.6
14	80.0	61.8	82.8	62.0	80.3	68.1	76.9	67.3
15	82.1	56.5	83.9	60.1	83.4	67.5	77.2	66.5
16	83.4	56.3	84.8	60.3	81.2	64.9	80.3	65.2
17	87.1	64.4	87.8	67.4	86.6	60.5	86.8	62.2
18	88.7	66.7	91.5	69.8	87.7	66.0	86.1	64.1
19	93.0	72.8	91.0	70.1	84.9	65.0	83.6	64.1
20	89.2	69.8	88.7	68.3	86.4	60.0	84.5	60.5
21	94.6	72.1	95.2	74.1	88.7	68.2	83.4	68.6
22	101.2	78.2	100.2	79.1	79.7	58.8	76.7	58.4
23	100.5	82.0	97.4	78.5	80.4	55.3	77.1	54.6
24	96.0	73.1	94.0	74.9	83.8	56.0	81.9	60.8
25	87.3	73.4	87.1	70.5	88.2	68.6	77.9	69.2
26	90.6	72.6	89.2	70.1	85.4	65.7	85.3	65.5
27	87.5	69.5	85.3	67.3	75.1	72.0	76.0	70.6
28	90.5	65.0	88.0	65.7	83.4	64.7	79.7	61.4
29	97.2	74.0	95.3	72.3	78.6	59.8	75.4	56.7
30	92.4	70.7	89.7	68.9	79.2	58.1	79.3	55.7
31	92.5	67.2	91.6	66.6	81.7	53.0	82.7	54.5
AVG.	90.1	68.6	89.6	68.5	84.6	64.3	82.3	64.4

TABLE 3: DAILY RAINFALL (INCHES) AT OR NEAREST TEST LOCATIONS FOR THE 2011 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRAIL

Date of Month	May		June		July		August	
	Georgetown	Townsend	Georgetown	Townsend	Georgetown	Townsend	Georgetown	Townsend
1	0.13	0.00	0.00	0.00	0.00	0.00	0.09	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
3	0.00	0.00	0.00	0.00	0.01	0.00	0.09	0.35
4	0.75	0.56	0.08	0.00	0.00	0.00	0.05	0.08
5	0.00	0.00	0.02	0.35	0.02	0.00	0.00	0.02
6	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.01
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
8	0.00	0.00	0.00	0.00	1.25	3.06	0.00	0.01
9	0.00	0.00	0.00	0.10	0.02	0.00	0.06	0.29
10	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.15	0.46	0.00	0.77	0.00	0.00
12	0.00	0.00	0.03	0.19	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.06	0.00	0.09	1.44
14	0.33	0.27	0.00	0.00	0.00	0.00	0.80	5.35
15	0.08	0.35	0.00	0.00	0.00	0.00	0.00	0.55
16	0.19	0.01	0.01	0.05	0.00	0.00	0.01	0.00
17	0.07	0.22	0.21	0.01	0.00	0.00	0.00	0.00
18	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00
19	0.27	0.26	0.00	0.00	0.17	0.61	0.26	1.67
20	0.00	0.19	0.49	0.04	0.00	0.00	0.00	0.01
21	0.00	0.00	0.00	0.18	0.00	0.00	0.73	0.61
22	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00
23	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.40	0.65	0.37	1.26
26	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	5.98	6.56
28	0.05	0.00	0.00	0.34	0.00	0.32	1.07	1.78
29	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00			0.00	0.00	0.00	0.00
TOTAL	1.98	2.07	1.85	1.72	2.50	6.16	9.61	20.00

TRAITS:



BVR = Roundup Ready + Corn borer + Root worm  
CB = Corn Borer  
CL = Clearfield  
GTCB = Glyphosate-resistant + corn borer  
HX = Herculex  
HXT = Herculex XTRA  
LL = Liberty Link  
PL = YieldGuard Plus  
PLRR = YieldGuard Plus + Roundup Ready  
RHXT = Roundup Ready + Liberty Link + Herculex XTRA  
RB = Roundup Ready + Corn borer  
RR = Roundup Ready  
RR2/YGCB = Roundup Ready 2 + YieldGuard + Corn borer  
RRRW = Roundup Ready + Root worm  
VT3 = YieldGard VT Triple  
13V = YieldGuard + Corn borer + Root worm + Roundup Ready  
XRR = Roundup Ready