

DELAWARE HYBRID FIELD CORN PERFORMANCE TRIALS - 2010

The 2010 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. Sixty-seven hybrids were evaluated at three locations: 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 (25 entries), early-medium (24 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.
- % 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. In order 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 utilizing 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 variety. Hybrids with excessive ear drop and high lodging percentages should be avoided.

Summary of Results

The 2010 growing season was characterized by a wet spring during planting followed by dry and hot conditions throughout the rest of the growing season (Tables 2 and 3). Delaware grain corn yield is expected to average 120 bu/A compared to 145 bu/A in 2009 (Delaware Agriculture Statistics Service). European corn borer incidence was very low across locations. Dover and Marydel locations were sprayed with Quadris, a foliar fungicide, and stayed green for a longer period. At these two testing sites there was very low to no stalk or root lodging.

Yields at Dover (Dickerson Farms) irrigated no-till location was excellent with an average yield of 219, 225, and 237 bu/A for the early, early-medium, and medium/medium-late maturity groups, respectively. There were significant differences between hybrids in yield and moisture for the early and early-medium maturity groups. Yield over moisture was significant only for the early maturity group. There were significant differences between hybrids only for moisture in the medium/medium-late maturity group.

The Kent County irrigated site at Marydel (Thomas Family Farms) averaged yields of 213, 215, and 225 bu/A for the early, early-medium, and medium/medium-late maturity groups, respectively. There were significant yield, moisture, and yield over moisture differences between hybrids across all maturity groups. There were no significant differences in plant

population, stalk lodging, and root lodging among hybrids for all maturity groups.

Yields were low at the Sussex County site (Research & Education Center) due to insufficient moisture and high heat throughout the growing season. The average yields for the early, early-medium, and medium/medium-late maturity groups were 167, 174, and 146 bu/A, respectively. There were significant differences between hybrids for yield, moisture, yield over moisture, and stalk lodging across all maturity groups. There were significant differences between hybrids in plant population for the early maturity group only.

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 most 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.

	Dickerson Farms (Irrigated)	Thomas Family Farms (Irrigated)	Research & Education Center (Irrigated)
Number of entries	67	67	67
Number of maturities	3	3	3
Target Population plants/A	30,000	30,000	30,000
Row length	17.4'	17.4'	17.4'
Number of rows harvested	2	2	2
Number of replications	4	4	4
Planting date	May 7	April 30	April 23
Harvest date	October 7	September 15	September 1
Soil type	Sassafras sandy loam	Sandy loam	Rosedale loamy sand
Previous crop	Soybean	Soybean	Soybean
Cover crop	None	None	None
Tillage practices	No-till	Disked, ripped, field cultivator	Disked, ripped, field cultivator
Cultivation	None	None	None
Fertilization	10 gallons/A of 19-18-0 (N,P,K) corn starter applied with planter and 55 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage.	4 tons of cow manure, 10 gallons/A of 19-18-0 (N,P,K) corn starter applied with planter and 40 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage.	10 gallons/A of 19-18-0 (N,P,K) corn starter applied with planter and 55 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage.
Herbicides	3 quarts/A of Lexar + 1 qt/A Simazine with 12.5 GPA of 30% UAN (40 lbs. N), applied pre-emergence. 0.75 ounces/A Steadfast was applied post-emergence.	3 quarts/A of Lexar + 1 qt/A Simazine with 12.5 GPA of 30% UAN (40 lbs. N), applied pre-emergence. 0.75 ounces/A Steadfast was applied post-emergence.	3 quarts/A of Lexar + 1 qt/A Simazine with 12.5 GPA of 30% UAN (40 lbs. N), applied pre-emergence. 0.75 ounces/A Steadfast was applied post-emergence.
Insecticide	5.5 lb/A Force 3G in seed furrow	5.5 lb/A Force 3G in seed furrow.	5.5 lb/A Force 3G in seed furrow
Irrigation	Center pivot	Center pivot	Lateral move

TABLE 2. DAILY TEMPERATURE AT OR NEAREST TEST LOCATIONS FOR THE 2010 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRIALS DURING MAY AND JUNE.

Date of Month	May				June			
	Georgetown		Dover		Georgetown		Dover	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	87.6	61.0	88.9	59.1	85.5	69.8	86.0	70.6
2	85.4	69.6	87.9	71.6	89.3	68.2	89.0	66.6
3	80.8	70.0	80.5	69.5	88.4	69.3	89.1	67.7
4	82.9	60.4	81.9	58.3	89.8	68.1	89.9	67.2
5	80.9	52.5	79.2	50.7	90.5	75.3	89.2	71.5
6	85.6	62.2	82.7	56.7	90.3	67.0	90.2	68.7
7	77.0	49.7	73.4	46.5	76.1	58.9	75.8	56.0
8	83.5	58.0	79.2	53.9	76.5	55.7	75.1	53.8
9	60.9	43.9	59.5	46.5	72.3	57.3	69.5	52.6
10	61.8	37.3	61.0	37.9	87.2	68.8	86.0	65.6
11	58.8	35.0	56.7	35.7	80.3	60.2	79.7	57.6
12	79.0	50.0	68.6	49.0	86.6	61.9	88.2	60.1
13	64.9	48.7	65.9	47.2	92.4	73.8	91.3	70.2
14	85.6	53.1	87.1	54.2	87.3	68.0	84.8	69.5
15	75.1	56.1	74.6	54.0	78.6	67.7	78.4	65.9
16	71.3	54.3	71.2	52.0	83.3	66.7	78.4	66.9
17	63.7	49.5	65.4	49.1	85.5	66.5	82.8	65.7
18	58.3	51.2	54.2	50.6	82.9	57.9	84.3	56.0
19	65.9	51.7	65.1	51.1	88.1	61.2	88.7	59.3
20	77.6	51.1	80.4	51.1	93.7	72.0	92.4	70.2
21	86.2	54.2	86.7	55.3	90.5	66.6	89.7	66.0
22	76.4	58.5	74.6	60.6	92.8	66.3	92.6	65.0
23	72.9	60.6	69.5	61.8	91.9	68.5	92.1	69.4
24	70.6	60.0	71.6	61.1	94.7	74.1	94.9	72.9
25	75.6	58.9	78.7	59.0	87.3	71.0	88.1	68.3
26	87.4	54.1	89.8	55.3	89.1	67.4	89.6	64.7
27	80.9	59.2	82.1	60.6	94.3	73.0	94.2	71.0
28	74.3	58.9	71.1	57.2	94.9	76.8	93.3	78.3
29	82.1	59.5	80.2	61.6	88.6	76.3	90.8	71.1
30	87.3	66.3	86.4	65.2	79.7	58.9	78.1	58.1
31	91.3	63.2	92.2	61.7				

Date	May				June			
AVG.	76.5	55.5	75.7	55.0	87.0	67.1	86.4	65.5

TABLE 2. DAILY TEMPERATURE AT OR NEAREST TEST LOCATIONS FOR THE 2010 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRIALS DURING JULY AND AUGUST (continued).

Date of Month	July				August			
	Georgetown		Dover		Georgetown		Dover	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	77.4	57.3	77.4	56.1	80.9	66.3	83.1	64.6
2	78.8	53.7	80.0	54.0	81.8	68.5	82.0	62.6
3	85.1	55.4	86.2	57.8	87.5	65.3	85.7	66.2
4	90.7	63.0	93.9	62.1	88.8	73.8	89.1	74.2
5	96.0	68.0	96.4	65.4	94.4	73.8	92.3	73.0
6	100.5	68.9	102.0	69.0	88.5	69.2	87.8	66.8
7	95.5	72.8	100.1	72.2	87.2	64.0	87.2	60.6
8	84.3	73.4	85.7	71.7	89.2	65.6	90.3	64.6
9	87.4	71.8	87.6	69.8	92.2	71.1	90.6	69.5
10	76.9	70.3	74.9	70.6	96.1	73.1	95.6	73.0
11	86.9	68.5	87.9	66.4	93.7	74.4	95.1	74.1
12	88.1	67.5	88.8	63.6	85.0	73.1	84.5	70.4
13	86.8	73.5	86.9	69.8	79.8	70.1	78.1	69.7
14	81.3	72.5	81.2	70.1	80.4	62.9	80.4	61.0
15	88.1	71.3	89.5	69.9	81.4	67.0	77.9	68.9
16	93.4	73.2	92.4	73.4	90.7	73.0	91.8	72.6
17	91.1	75.1	89.8	72.2	83.2	75.5	89.9	72.4
18	92.3	72.8	90.7	71.9	76.6	68.3	76.7	66.7
19	88.6	74.9	89.6	72.2	86.1	69.7	86.6	67.6
20	92.2	73.4	88.9	71.4	89.9	68.4	88.9	65.0
21	90.7	73.6	90.6	72.6	88.7	65.1	87.6	64.1
22	91.2	72.1	90.3	72.2	85.5	72.5	87.0	70.5
23	94.8	72.1	93.9	70.4	82.3	67.8	82.9	67.3
24	97.9	79.7	95.8	78.4	71.2	65.2	71.7	63.5
25	97.9	72.2	93.7	69.9	76.6	62.8	76.1	63.2
26	84.7	66.9	83.7	64.1	84.1	62.7	82.3	61.3
27	88.3	61.5	86.6	62.4	80.9	56.9	79.7	55.4
28	89.8	72.9	88.4	70.9	83.0	56.3	85.6	55.4
29	90.8	74.4	89.7	76.0	91.1	56.7	89.9	57.4
30	81.9	65.1	81.9	62.6	92.8	63.8	92.7	63.5

Date	July				August			
31	85.7	60.4	85.9	59.1	94.4	62.2	94.0	62.8
AVG.	88.5	69.3	88.8	68.0	85.9	67.3	85.9	66.1

TABLE 3: DAILY RAINFALL (INCHES) AT OR NEAREST TEST LOCATIONS FOR THE 2010 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRAIL

Date of Month	May		June		July		August	
	Georgetown	Dover	Georgetown	Dover	Georgetown	Dover	Georgetown	Dover
1	0	0	0	.01	0	0	.08	0
2	0	0	0	0	0	0	0	0
3	0	.08	0	.04	0	0	0	0
4	0	0	0	0	0	0	0	.19
5	0	0	0	0	0	0	.36	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	.04	.02	0	.01	0
10	0	0	0	0	1.15	1.98	0	0
11	.12	.013	0	0	.01	.07	0	0
12	.06	.15	0	0	0	0	.54	.76
13	0	0	0	.26	.31	.37	0	0
14	.37	.09	0	0	.03	.62	0	0
15	0	0	0	0	0	.04	0	.08
16	0	0	0	.24	0	0	0	0
17	.03	.27	0	0	0	.08	0	0
18	1.12	1.37	0	0	0	0	.69	1.8
19	0	.01	0	0	0	.02	0	.01
20	0	0	0	0	0	.03	0	0
21	0	0	0	0	0	0	0	0
22	0	.10	0	.22	0	0	.34	.95
23	0	.12	0	0	0	0	0	0
24	0	.09	0	.15	0	0	.01	0
25	0	0	0	0	.09	1.13	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	.10	.23	0	0	0	0	0
29	0	0	.05	0	.78	0	0	0

30	0	0	0	0	0	0	0	0
31	0	0			0	0	0	0
TOTAL	1.7	2.51	.28	.96	2.39	4.34	2.03	3.79

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