

## **DELAWARE HYBRID FIELD CORN PERFORMANCE TRIALS - 2012**

The 2012 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 hybrids were evaluated at four locations: Baker Farms at Middletown, DE (dryland); Dickerson Farms at Dover, DE (center pivot irrigation); Thomas Family Farms at Wyoming, DE (center pivot irrigation); and Research & Education Center at Georgetown, DE (lateral move irrigation). Hybrids were divided into three maturity groups; early (15 entries), early-medium (25 entries), and medium (20 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 moisture at harvest 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 plants that were broken below the ear.
- % root lodging is the percentage of plants that had lodged more than 30 °.
- % green snap is the percentage of plants that were broken due to wind storm that occurred during the early summer.

### 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 2012 growing season was characterized by favorable conditions during planting followed by severe drought and high temperatures throughout the early growing season to flowering time (Tables 2 and 3) and resulted in low yields at the dryland location. Delaware grain corn yield in 2012 is expected to average 115 bu/A compared to 130 bu/A in 2011 (Delaware Agriculture Statistics Service). We observed green snap as a result of heavy wind storm in June, particularly at Middletown and Dover locations and this have contributed to low yield for some of the susceptible hybrids to green snap. The stalks were broken at the ear node and were not able to produce any viable ear. Ear drop was negligible at all locations due to very low to no level of European corn borer incidence.

Yields at Middletown (Baker Farms) dryland no-till location were reduced due to insufficient rainfall and high heat with an average yield of 129, 144, and 150 bu/A for the early, early-medium, and medium maturity groups, respectively. Some hybrids showed high incidence of green snap and damaged plants were not able to produce an ear. There were significant differences between hybrids in yield, grain moisture, yield/moisture, and green snap across all maturity groups. Root lodging was significant only for the early-medium maturity group. The root lodging at this location was primarily due to winds which occurred during the early summer rather than fall.

Yields averaged 210, 218, and 220 bu/A for the early, early-medium, and medium maturity groups, respectively, at Dover (Dickerson Farms) irrigated no-till location. Some hybrids showed high incidence of green snap and damaged plants were not able to produce an ear. There were significant differences between hybrids in yield, grain moisture, and green snap across all maturity groups. Yield over moisture was significant for the early-medium and medium maturity groups. There were significant differences in stalk lodging and plant population for the early maturity group.

The Kent County irrigated site at Wyoming (Thomas Family Farms) was excellent with an average yield of 229, 236, and 233 bu/A for the early, early-medium, and medium maturity groups, respectively. Some hybrids showed moderate incidence of green snap and damaged plants were not able to produce an ear. There were significant yield, grain moisture, and yield over moisture differences between hybrids across all maturity groups. There were significant differences in plant population and green snap for the early and early-medium maturity groups. There were also significant differences in stalk lodging for the medium maturity group.

Yields averaged 212, 226, and 222 bu/A for the early, early-medium, and medium maturity groups, respectively, at the Sussex County site (Research & Education Center). There were significant differences between hybrids in yield, grain moisture, and yield over moisture across all maturity groups. There was also a significant difference in plant population for the early and medium maturity groups. Stalk lodging was significant only for the early-medium 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 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 Middletown (Dryland)	Dickerson Farms - Dover (Irrigated)	Thomas family farms Wyoming (Irrigated)	Research & Education Center Georgetown (Irrigated)
Number of entries	60	60	60	60
Number of maturities	3	3	3	3
Target Population plants/A	26,000	30,000	30,000	30,000
Row length	17.4'	17.4'	17.4'	17.4'
Number of rows harvested	2	2	2	2
Number of replications	4	4	4	4
Planting date	April 30	May 2	May 2	April 27
Harvest date	September 24	September 27	September 26	September 17
Soil type	Matapeake silt loam	Sassafras sandy loam	Sandy loam	Rosedale loamy sand
Previous crop	Corn	Soybean	Soybean	Soybean
Cover crop	None	None	None	None
Tillage practices	No-till	No-till	Disked, ripped, field cultivator	Disked, ripped, field cultivator
Cultivation	None	None	None	None
Fertilization	12.5 Gallons/A of 17-10-0 prior to planting and 40 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage	12.5 Gallons/A of 17-10-0 prior to planting and 60 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage.	12.5 Gallons/A of 17-10-0 prior to planting and cow manure. 40 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage.	12.5 Gallons/A of 17-10-0 prior to planting and 60 gallons/A nitrogen side-dressed as 30% UAN solution at mid-whorl stage.
Herbicide	3 quarts/A of Lexar + 1 qt/A Simazine, applied pre-emergence and accent 0.9 oz/A with 80/20 surfactant 0.25% v/v applied post-emergence.	3 quarts/A of Lexar + 1 qt/A Simazine applied pre-emergence.	3 quarts/A of Lexar + 1 qt/A Simazine applied pre-emergence and accent 0.9 oz/A with 80/20 surfactant 0.25% v/v applied post-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	5.5 lb/A Force 3G in seed furrow	5.5 lb/A Force 3G in seed furrow
Irrigation	None	Center pivot	Center pivot	Lateral move

TABLE 2. DAILY TEMPERATURE AT OR NEAREST TEST LOCATIONS FOR THE 2012 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRIALS

**DURING MAY AND JUNE.**

Date of Month	May						June					
	Georgetown		Dover		Townsend		Georgetown		Dover		Townsend	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	80	57	80	54	79	55	83	61	81	60	76	59
2	63	50	58	54	64	53	73	57	73	61	71	57
3	74	49	68	51	59	52	77	55	78	57	76	55
4	79	53	79	56	77	57	73	58	72	59	69	57
5	73	55	73	58	74	60	67	52	69	54	66	53
6	65	47	65	51	67	51	71	48	74	50	75	48
7	70	42	66	46	64	48	79	51	80	55	78	54
8	75	57	75	57	72	53	82	56	83	58	81	54
9	69	58	72	62	74	56	88	63	89	64	87	58
10	65	50	71	52	66	49	92	63	91	66	90	63
11	69	45	71	46	69	47	89	66	83	69	83	66
12	76	47	77	51	76	45	74	67	76	68	72	68
13	78	56	81	59	79	56	80	66	80	67	79	68
14	74	61	71	60	70	61	74	62	78	65	78	63
15	79	54	80	64	78	64	76	57	79	60	79	56
16	82	63	84	62	80	63	76	53	79	56	78	54
17	71	50	72	55	71	53	71	52	72	57	74	55
18	70	46	70	50	73	49	72	46	70	52	70	51
19	75	46	81	50	79	49	83	63	82	64	83	64
20	71	50	75	52	77	53	95	65	96	69	70	69
21	74	62	70	62	72	61	96	72	97	75	94	72
22	76	62	78	62	76	62	94	71	96	77	92	68
23	79	63	76	62	77	61	89	69	87	69	84	66
24	81	60	80	63	81	65	89	63	85	65	87	62
25	82	67	81	66	72	66	86	69	84	66	82	66
26	86	62	84	65	85	66	78	58	78	59	76	58
27	86	66	86	68	86	68	86	53	86	58	84	55
28	88	70	90	67	89	65	91	59	98	73	91	61
29	87	73	90	72	89	68	100	71	95	69	95	72
30	74	66	76	68	77	66	92	70	96	73	90	68
31	84	63	81	64	81	62						
AVG.	75.9	56.5	76.2	58.4	75.3	57.6	82.5	60.5	82.9	63.2	80.3	60.7

**TABLE 2. DAILY TEMPERATURE AT OR NEAREST TEST LOCATIONS FOR THE 2012 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRIALS**

DURING JULY AND AUGUST ( continued ).

Date of Month	July						August					
	Georgetown		Dover		Townsend		Georgetown		Dover		Townsend	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	96	71	96	73	92	70	81	68	81	70	82	67
2	91	69	90	71	88	66	89	65	89	68	91	64
3	94	64	94	67	90	63	93	71	94	73	94	67
4	93	74	94	75	92	70	90	73	90	74	89	70
5	99	78	96	79	95	77	90	75	94	75	92	71
6	96	74	96	76	83	72	86	71	88	75	87	72
7	101	73	101	77	98	75	86	69	89	71	84	68
8	96	76	92	77	91	75	87	71	86	72	85	69
9	81	72	85	74	78	72	90	72	90	72	90	68
10	85	70	86	70	N/A	N/A	84	70	86	71	84	70
11	83	67	86	69	86	64	83	72	84	73	85	72
12	83	65	85	70	86	64	83	69	84	71	83	67
13	87	93	88	66	88	64	87	64	87	64	85	61
14	84	66	84	71	84	70	85	68	86	70	82	68
15	89	74	94	74	91	74	85	70	86	70	82	68
16	91	74	93	75	91	71	86	66	87	67	84	65
17	96	72	99	74	97	69	88	66	89	68	88	65
18	97	76	100	80	100	72	79	65	81	67	80	62
19	92	73	95	73	88	72	80	59	79	62	76	59
20	82	69	87	70	74	66	77	65	81	65	79	64
21	73	69	75	68	74	65	81	63	81	63	80	60
22	82	66	83	66	82	66	83	61	86	64	83	61
23	89	67	89	72	88	70	83	62	86	65	84	62
24	93	73	93	73	93	72	82	63	86	67	84	63
25	85	66	88	68	84	64	75	66	82	67	77	67
26	94	66	94	68	94	69	81	66	82	70	82	69
27	94	70	92	72	89	71	85	73	84	73	87	69
28	91	68	91	73	92	72	86	68	87	73	86	65
29	85	66	85	70	84	67	82	63	84	66	81	61
30	83	69	84	70	84	68	85	61	86	63	84	59
31	83	70	84	71	85	68	89	69	90	70	90	65
AVG.	89.3	70.9	90.3	72.0	85.2	67.0	84.6	67.2	86.0	69.0	84.5	65.8

**TABLE 3: DAILY RAINFALL (INCHES) AT OR NEAREST TEST LOCATIONS FOR THE 2012 DELAWARE CORN HYBRID VARIETY PERFORMANCE TRIALS**

Date of Month	May			June			July			August		
	Georgetown	Dover	Townsend	Georgetown	Dover	Townsend	Georgetown	Dover	Townsend	Georgetown	Dover	Townsend
1	0.21	0.02	0.01	0.17	T	0.37	0.00	0.00	0.01	0.06	0.08	0.12
2	0.04	T	0.36	0.25	0.00	0.16	0.17	0.37	0.15	0.00	0.02	0.00
3	0.02	0.15	0.15	0.00	0.00	0.08	0.00	0.00	0.00	0.38	0.00	1.52
4	0.00	T	0.00	0.11	0.45	0.11	0.00	0.00	0.03	0.00	0.00	0.07
5	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.50
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.72
7	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.02	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.00
9	1.15	0.18	1.06	0.00	0.00	0.00	0.77	0.26	0.12	0.00	0.01	0.00
10	0.05	0.35	0.07	0.00	0.01	0.00	0.00	0.00	N/A	1.77	M	0.61
11	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.13	M	0.00
12	0.00	0.00	0.00	0.36	0.40	0.94	0.00	0.00	0.00	0.00	M	0.00
13	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.63	0.00
14	0.00	0.02	0.26	0.01	T	0.00	0.03	0.03	0.17	0.00	0.14	0.65
15	0.25	0.49	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T	0.00
16	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
18	0.00	0.00	0.00	0.00	T	0.00	0.00	0.00	0.51	0.31	0.63	0.67
19	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.58	0.04	0.05	0.00	0.00
20	0.85	0.00	0.00	0.00	0.00	0.00	0.28	1.74	0.38	0.00	0.00	0.02
21	0.05	0.20	0.01	0.00	0.00	0.00	0.00	0.07	0.02	0.00	0.00	0.00
22	0.01	T	0.01	0.00	0.00	0.49	0.02	0.00	0.00	0.00	0.00	0.00
23	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.01	0.00	0.02	0.40	0.00	0.00	0.00	0.00	1.22	M	0.05
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	1.00	M	0.51
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.76	0.16
28	0.00	0.00	0.00	0.00	0.03	0.00	0.65	0.00	0.00	0.00	0.05	0.03
29	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
30	0.58	0.77	0.04	0.11	0.00	0.52	0.00	0.00	0.18	0.00	0.0	0.00
31	0.01	0.02	0.00				0.00	0.00	0.00	0.00	0.00	0.00
Total	3.22	2.29	2.86	1.26	1.46	2.68	1.95	3.17	1.77	4.93	2.68	5.71



## 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