

Corn production is greatly affected by hybrid selection.

This publication reports the agronomic performance of entries in the 2012 South Dakota performance trials for glyphosate-resistant field corn hybrids.

Major factors in hybrid selection include:

- Yield
- Maturity
- Lodging resistance
- Seed traits

Corn Hybrid Performance Trials Results - Volga

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These performance trials are conducted by the South Dakota Crop Performance Testing program at South Dakota State University. Corn test trial information is listed in table A, performance table footnote references including technology traits and seed treatments are listed in Table B. Mailing addresses for seed company entrants that participated in the 2012 test trials are listed in table C.

General Test Procedures

Seed companies pick one or more of the six test locations where their entries are tested. Entries are placed into "early" or "late" maturity trials. The relative maturity breaks between the early and late tests are 95 days for Bath and South Shore, 100 days for Bancroft and Volga, 105 days for Geddes, and 110 days for Beresford. Hybrids are assigned to trials based on the relative maturity rating reported by the participating seed company. In 2012, results from only five of the test locations are reported. Information from Beresford is not reported because the severe drought at that location prevented the collection of valid data.

Table A. General test information for 2012.	
LOCATION:	Glyphosate resistant corn trial results, Volga, SD.
COOPERATOR:	SDSU Plant Science Research Farm – Volga, Doug Doyle and staff.
SOIL TYPE:	Brandt silty clay loam, 0-2% slope
TILLAGE:	Conventional
FERTILITY-YIELD GOAL:	200 bushel
PREVIOUS CROP:	Spring wheat (stubble)
ROW SPACE:	30 inches
SEEDING POPULATION:	30,000/acre
WEED CONTROL:	Pre: 1qt Dual 2, Post: 1 quart Roundup
INSECT CONTROL:	None
DISEASE CONTROL:	None
DATE SEEDED:	April 30, 2012

Experimental Procedures

Entries were seeded in three replications, with each hybrid randomly located within each trial. Plots consisted of four 30-inch rows that were 20-feet long, with the center two rows harvested for yield. A Monosem precision row crop planter was used for seeding plots at all locations. In 2012, the precision planter was calibrated to deliver 29,621 seeds per acre, regardless of seed quality and germination percentage. No seeding rate adjustment was made for low germination. Therefore, percent stand is an indication of initial seed quality and the ability of the seed to cope with the production environment from seeding to harvest. Soil type, land preparation and previous crop history, pest control, and fertility yield goal at each test site is outlined in table A. Seedbed preparation was good at all locations. A starter fertilizer of 100 pounds/acre of 37-18-00 was applied 2" below and 2" to the side (2 x 2) of the seed row.

Measures of Performance

Yields are obtained from the South Dakota Crop Performance

Testing Program. Two-year and current yield averages are included where hybrids have been tested for the most recent two-year period.

Yield. Yield values are an average of three replications and are expressed as bushels per acre, adjusted to 15.5% moisture on a dry-matter basis and a bushel weight of 56 pounds. Statistical tests were conducted to determine whether differences obtained were caused by variations in environment or were true hybrid differences. In 2012, the coefficient of variation (CV) values (a measure of experimental error) for yield was quite variable, ranging from a low of 4% in both trials at Bath to a high of 12% and 15% for the early and late trials, respectively, at Geddes. Experimental error may be the result of several factors, including test methods, or factors such as moisture, temperature, soil variations, or agronomic factors like seeding date, reseeding, or seed quality factors—all of which may or may not be controllable in a given year. Clearly, this year, drought

and variable seasonal moisture distribution and/or subsoil moisture conditions, along with above-average temperatures, combined to produce highly variable yields across our South Dakota corn growing regions. The top yield averages occurred at Bath and Bancroft, whereas, the plot grain yields were so low at Beresford the harvest equipment could not determine valid harvest yields.

Grain moisture content.

Moisture content is expressed as the percentage of moisture in the shelled corn at harvest. Hybrids that are above average in yield and can be stored without additional drying are desirable. At harvest, moisture values were determined by the combine moisture meter, which in turn was periodically verified with a Dickey-John GAC II meter.

Use of tables. Check for the "least significant difference" (LSD) value at the bottom of each column of data averages. The LSD value indicates how much a variable such as yield must differ between two hybrids

before there is a significant yield difference. LSD values are given at the bottom of every column where there is significant difference among the averages within the column. If differences among the averages within a column are not significant, the LSD value is reported as "nonsignificant" (NS). The top performance group (TPG) for the performance factors yield (bu/a), bushel weight in (lbs.), harvest

grain moisture (%), lodging below the ear (%), and final stand (%) are indicated in the performance tables by the shaded data values. Evaluate the performance of each hybrid (row) by moving across the table and observing if any of the reported performance values are shaded. The more shaded performance values in each row, the better the hybrid did as a top-performing hybrid for a given test trial.

Performance Trial Results

Note: Evaluate the performance of each hybrid (row) by moving across the table and observing if any of the reported performance values are shaded. The more shaded performance values there are in each row the better the hybrid did as a top-performing hybrid for a given test trial.

No.	Explanation of references
[1]	Entries are listed by Brand/Variety– Entries are sorted by 2-yr then by 2012 yield average.
[2]	Technology traits: Agr. = Agrisure; SmartStax or GenSSX= DowAgrosciences (DAS) or Monsanto Genuity (Gen), respectively; HX1, HXX = Herculex by DAS & Pioneer Hi-Bred, Opt. = Optimum AcreMax1 or Optimum AcreMaxXtra by Pioneer Hi-Bred, YG = Monsanto YieldGard.
[3]	Seed treatments: P/V500 = Poncho/Votivo 500, P/V1250 = Poncho/Votivo1250; CM250 = Cruiser Maxx250, CM1250 = Cruiser Max1250; MHL = Maxim XL, MQ = Maxim Quattro; PPST250 = Pioneer Premium Seed Treatment.
[4]	Brand Relative Maturity (Rel. Mat.)– the relative maturity rating reported by the test trial entrant.
[5]	Lodging Percentage– stalks broken below the ear as a percentage of the final stand; look for low values.
[6]	Final Stand Percentage – the number of standing stalks at harvest as a percentage of the seeding population.
[7]	Least Significant Difference (LSD 0.05) – the difference any two values within a column must be equal to or exceed for the values to be significantly different (0.05 level of probability). If the difference is less than the LSD value the difference between them is nonsignificant (NS).
[8]	Min. TPG-avg.– the minimum column value for yield, bushel weight, and final stand percentage that a hybrid must equal or exceed to be in the top performance group (TPG).
[9]	Max. TPG-avg.– the maximum column value for grain moisture at harvest, lodging percentage, or lodging score that a hybrid must equal or be less than to be in the TPG.
[10]	Coefficient of variation (C.V.)– the percent of experimental error associated with a test trial. Ideally, the CV value for yield is less than 15%. Values less than 5% are less common ; while values of 6-15% are more common. If a value exceeds 15%; the trial had too much error to be valid, so the results are not reported.

Table 1. Volga early maturity Roundup Ready corn hybrid test results, 2011-12, Plant Science Research Farm

Brand/Hybrid [1] + Tech. Trait [2] + Seed Trt. [3]	Rel. Mat. [4]	Yield Averages *,#		Other 2012 Averages##			
		2-Yr bu/a	2012 bu/a	Bu. Wt. lb	Grain Moisture %	Ldg. % [5]	Final Stand % [6]
HOEGEMEYER/ HPT 7042 + OptAMX + CM250	100	186	157	58	13	0	83
DEKALB/ DKC50-66 + YGVTRWRR2 + P/V500	100	185	162	58	12	0	96
CHANNEL/ 197-67VT3P + GenVT3P + P/V500	97	184	161	60	14	2	91
WENSMAN/ W 7290VT3PRO + GenVT3P + Acceleron	99	182	154	58	14	3	92
HOEGEMEYER/ 6838 3000GT + Agr3000GT + CM250	98	182	145	58	12	6	92
HOEGEMEYER/ 6200 GTCBLL + AgrGT/CB/LL + CM250	92	181	141	58	13	0	76
NUTECH/ 5N-001 + Agr3000GT + MQ	100	176	138	57	13	2	82
SEEDS 2000/ 9902 VP3111 + GenVT2P + Acceleron	98	175	132	58	12	14	88
DEKALB/ DKC48-12 + GenSSX + P/V500	98	169	132	57	13	0	97
RENK/ RK585VT3P + GenVT3P + Acceleron	95	.	162	59	12	0	95
PIONEER/ P9834HR + HX1RR2 + PPST250	98	.	160	57	14	0	89
G2 GEN./ 5X-0004 + HXXRR2 + P/V1250	100	.	159	55	12	0	84
PIONEER/ P0062XR + HXXRR2 + PPST250	100	.	151	57	13	1	84
DEKALB/ DKC46-20 + GenVT3P + P/V500	96	.	150	59	15	0	97
DEKALB/ DKC49-30 + GenVT3P + P/V500	99	.	150	59	13	0	98
G2 GEN./ 5Z-198 + OptAMX + P/V1250	98	.	144	57	12	0	80
DEKALB/ DKC43-48 + GenVT3P + P/V500	93	.	141	58	13	0	95
WENSMAN/ W 7268VT3 + YGVTRWRR2 + Acceleron	96	.	141	58	12	5	94
EPLEY/ E9505RR + RR2 + MQ	95	.	138	59	12	2	93
RENK/ RK576VT3P + GenVT3P + Acceleron	97	.	137	58	11	0	93
MASTERS CHOICE/ MCT-4563 + Agr3000GT + CM250+MXL	96	.	134	58	12	1	51
CHANNEL/ 196-76VT3P + GenVT3P + P/V500	96	.	134	60	14	0	92
PIONEER/ P9917AM1 + OptAM1 + PPST250	99	.	130	59	14	1	88
DEKALB/ DKC43-10 + GenVT2P + P/V500	93	.	127	58	12	0	90
WENSMAN/ W 9288VT3PRO + GenVT3P + Acceleron	98	.	124	60	14	0	92
RENK/ RK578VT3P + GenVT3P + Acceleron	96	.	123	58	13	0	89
Trial avg.:	97	180	143	58	13	1	88
High avg.:	100	186	162	60	15	14	98
Low avg.:	92	169	123	55	11	0	51
[7] LSD(.05):		NS**	21	1	2	2	6
[8] Min.TPG value:		169	141	59	.	.	92
[9] Max.TPG value:		.	.	.	12	2	.
[10] Coef. of var.:		5	9	1	11	98	4
No. entries:	26	9	26	26	26	26	26

NOTE: Table references [1-10] are explained in table B.
 * Entries are listed by Brand/Hybrid and sorted by 2-yr then by 2012 yield average.
 # Adjusted to 15.5% moisture.
 ** NS indicates differences between column values are nonsignificant.
 ## Shaded column values are included in the top-performance group (TPG).

Table 2. Volga late maturity Roundup Ready corn hybrid test results, 2011-12, Plant Science Research Farm.

Brand/Hybrid [1] + Tech. Trait [2] + Seed Trt. [3]	Rel. Mat. [4]	Yield Averages *,#		Other 2012 Averages##			
		2-Yr bu/a	2012 bu/a	Bu. Wt. lb	Grain Moisture %	Ldg. % [5]	Final Stand % [6]
PIONEER/ 36V53 + HX1RR2 + PPST250	102	188	163	57	12	0	91
PIONEER/ P0533AM1 + OptAM1 + PPST250	105	187	147	58	13	0	81
EPLEY/ E1418GT3000 + Agr3000GT + CM250	104	178	142	58	15	1	86
G2 GEN./ 5X-903 + HXXRR2 + MQ	103	177	144	58	15	0	84
WENSMAN/ W 7320VT3PRO + GenVT3P + Acceleron	101	175	144	59	14	0	91
CHANNEL/ 203-43VT3P + GenVT3P + P/V500	103	172	132	58	16	0	92
DAIRYLAND/ DS9303SSX + DAS Smart Stax + Activa Compl.	103	171	137	58	13	0	89
G2 GEN./ 5H-806 + HX1RR2 + MQ	107	164	126	58	15	5	91
DEKALB/ DKC52-61 + GenVT2P + P/V500	102	.	161	58	12	0	94
PIONEER/ P0193HR + HX1RR2 + PPST250	101	.	154	56	12	0	84
NUTECH/ 5B-604 + AgrGT/CB/LL + MQ	104	.	152	56	12	0	86
NUTECH/ 5N-0103 + Agr3000GT + CM250	101	.	149	57	12	1	87
RENK/ RK635VT3P + GenVT3P + Acceleron	102	.	149	57	13	0	91
DEKALB/ DKC52-04 + GenVT3P + P/V500	102	.	148	58	14	0	83
PIONEER/ P0876HR + HX1RR2 + PPST250	108	.	148	59	16	1	87
NUTECH/ 5N-907 + Agr3000GT + CM250	110	.	148	56	13	1	86
G2 GEN./ 5Z-802 + OptAMX + P/V1250	102	.	147	57	14	0	76
G2 GEN./ 5H-0504 + HX1RR2 + P/V1250	105	.	147	57	14	0	89
DAIRYLAND/ DS9501SSX + DAS Smart Stax + Activa Compl.	101	.	146	58	12	0	92
WENSMAN/ W 9325VT3PRO + GenVT3P + Acceleron	102	.	146	60	13	1	87
DAIRYLAND/ DS6903 + RR2 + CM250	103	.	145	60	15	5	86
SEEDS 2000/ 3011 G3 + Agr3000GT + Acceleron	101	.	143	56	13	1	85
DAIRYLAND/ DS6604 + RR2 + CM250	104	.	141	58	12	1	86
G2 GEN./ 5H-202 + HX1RR2 + P/V1250	102	.	138	58	15	12	95
WENSMAN/ W 7330VT3 + GenVT3P + Acceleron	103	.	136	60	14	0	88
CHANNEL/ 202-25VT3P + GenVT3P + P/V500	102	.	135	60	12	0	90
G2 GEN./ 5H-502 + HX1RR2 + MQ	102	.	130	58	15	0	76
RENK/ RK708SSTX + GenSSX + Acceleron	105	.	128	59	15	1	89
DAIRYLAND/ DS9402SSX + Smart Stax + Activa Compl.	102	.	123	59	13	0	76
Trial avg.:	103	177	143	58	14	1	87
High avg.:	110	188	163	60	16	12	95
Low avg.:	101	164	123	56	12	0	76
[7] LSD(.05):		17	21	1	2	4	5
[8] Min.TPG value:		171	142	59	.	.	90
[9] Max.TPG value:		.	.	.	14	4	.
[10] Coef. of var.:		5	9	1	9	187	3
No. entries:	29	8	29	29	29	29	29

NOTE: Table references [1-10] are explained in table B.
* Entries are listed by Brand/Hybrid and sorted by 2-yr then by 2012 yield average.
Adjusted to 15.5% moisture.
** NS indicates differences between column values are nonsignificant.
Shaded column values are included in the top-performance group (TPG).

Early maturity trial, Table 1.

The test-trial yield averages were **180 bu/a** for two years and **143 bu/a** in 2012. Hybrids with yield averages of **169 bu/a** or more for two years and **141 bu/a** or more for 2012 qualified for the TPG. There were no differences in yield average among the hybrids tested two years, so all qualified for the TPG. In 2012, bushel weights averaged **58 lbs.**, grain moisture averaged **13%**, lodging percentage averaged **1%**, and final stand percentage averaged **88%**. In order for hybrids to be in the TPG for these factors, they had to average **59 lbs.** or more in bushel weight, **12%** or less in grain moisture, **2%** or less in lodging

percentage, and **92%** or more for final stand percentage. In order for a hybrid variable to differ from one hybrid compared to another, their difference had to equal **21 bu/a** or more for yield in 2012, **1 lb.** or more in bushel weight, **2%** or less in grain moisture, **2%** or less in lodging percentage and **6%** or more in the final stand percentage.

Late maturity trial, Table 2. The test-trial yield averages were **177 bu/a** for two years and **143 bu/a** in 2012. Hybrids that yielded **171 bu/a** or more for two years and **142 bu/a** in 2012 qualified for the TPG. In 2012, bushel weights averaged **58 lbs.**, grain moisture

averaged **14%**, lodging averaged **1%**, and percent final stand averaged **87%**. In order for hybrids to be in the TPG for these factors, they had to average **59 lbs.** or more in bushel weight, **14%** or less in grain moisture, **4%** or less in lodging percentage, and **90%** or more for final stand percentage. In order for a hybrid variable to differ from one hybrid compared to another, their difference had to equal **17 bu/a** or more for two years and **21 bu/a** or more for yield in 2012; and **1 lb.** or more in bushel weight, **2%** or less in grain moisture, **4%** or less in lodging percentage and **5%** or more in the final stand percentage in 2012.

Table C. Mailing addresses for seed entries in the 2012 corn hybrid trials and listed by seed brand name	
Seed brand	Seed company mailing address
Channel	Channelbio Corp., Box 277, Laurel, NE 68745
Dairyland	PO Box 958, West Bend, WI 53095
Dekalb	46040 SD Hwy 44, Chancellor, SD 57015
Epley Bros.	Epley Bros. Hybrids Inc., 22494 Yale Ave., Shell Rock, IA 50670
G-2 Genetics	G-2 Genetics, 2321 North Loop Drive, Suite 230, Ames, IA 50010
Hoegemeyer	Hoegemeyer Hybrids, 1755 Hoegemeyer Road, Hooper, NE 68031
Masters Choice	3010 St. Rt. 146 E, Anna, IL 62906
NuTech	Nutech Seed, LLC, 2321 North Loop Drive, Suite 230, Ames, IA 50010
Petersen Farms	3104 164th Ave. SE, Harwood, ND 58042
Pioneer	Pioneer Hi-Bred International, 151 Saint Andrews Court-Suite 910, Mankato, MN 56001
ProSeed	705 E. Brewster, Harvey, ND 58341
Renk	6809 Wilburn Road, Sun Prairie, WI 53590
Seeds 2000	Seeds 2000, 115 N 3rd St., Breckenridge, MN 56520
Wensman	Wensman Seed Co., PO Box 190, Wadena, MN 56482



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