2023 Corn Hybrid Demonstration Program Results

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Program Objectives: The MSU Extension Corn Hybrid Demonstration Program is intended to provide growers, crop consultants and other agricultural professionals a first-hand opportunity to observe performance of elite hybrids and generate information to better assess performance and adaptability in Mississippi. This program provides a unique opportunity to observe and evaluate plant characteristics and environmental responses of our best corn hybrids in local, on-farm demonstration plots representing our production systems.

Program Methodology: Hybrids voluntarily entered in this program must be validated by producing superior grain yield in the Mississippi Corn for Grain Hybrid Trials or be a relevant market standard. Hybrids are selected annually and grouped into two distinct sets based upon performance in dryland or irrigated culture, since both these cropping systems are prevalent in Mississippi and can affect adaptability. Seed companies are granted the discretion to enter hybrids which have demonstrated superior performance in the Mississippi Corn for Grain Hybrid Trials, or a newly released hybrid that they believe is more promising or better adapted. This establishes an elite group of corn hybrids for evaluation in the program. Each standardized set of hybrids is grown at numerous field locations representing Mississippi cropping systems. Mississippi State University Extension regional agronomic crop specialists and county agricultural agents coordinate locations with grower cooperators and supervise plots. Mississippi Agricultural and Forestry Experiment Station scientists also grow some trials on branch stations.

Grain Yield Data: Hybrids evaluated in this program are generally planted in “strip trials.” Yield data generated from a single location are not as reliable as when treatments are replicated numerous times. Treatment replication reduces the effect of numerous factors which can impart variability that may affect performance and confound results. Thus, average yields are calculated from data collected at multiple locations and presented in this publication to better assess yield performance related to *hybrid genetics*. Analyses of yield data were performed with SAS using GLM procedures, and means are separated at the 0.05 level. This yield data derived from numerous, diverse environments is intended to supplement data generated in university hybrid trials.

Technology Traits: All hybrid entries are glyphosate tolerant. Inclusion of other traits is optional and is primarily based on product availability and the discretion of the respective seed companies. Corn borer protection normally enhances yield at locations where corn borers are present. All seed are commercially treated with an insecticide seed treatment, which is at the discretion of each respective seed company. Seed treatments are utilized to minimize damage from insect pests during seedling establishment.

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Relative Maturity: Maturity is measured and reported as the number of days to tassel, as well as grain moisture at harvest. Grain moisture is represented for locations where grain was still actively drying at harvest.

Plant Height: Full plant height is measured after tassel emergence. Plant height is one of several factors which may affect light interception, which is critical to photosynthesis and grain yield. Short plant height may limit potential light interception, particularly in wide rows. Tall plants are generally more likely to lodge and will likely have higher water demand during the growing season.

Ear Height: Ear height is measured and represented as a mean height above the soil surface. High ear placement may promote more efficient energy utilization in the plant, as leaves in the upper canopy intercept more light and produce more photosynthetic energy for the developing ear. However, high ear placement may make plants top-heavy and thus more prone to lodge when exposed to strong wind.

Root Strength: This is an evaluation of a hybrid's ability to resist root lodging, which occurs when the force caused by wind exceeds the root's ability to stabilize plants and keep them erect. Thus, the entire stalk leans or completely falls to the ground, often dislodging part of the roots from the soil. This may promote a "domino effect," causing root lodging across a field. This may greatly hinder harvest efficiency, because plants lay nearly flat on the ground and are partly uprooted, making stalks very difficult to gather into a combine to harvest.

Stalk Strength: An evaluation of a hybrid's ability to resist stalk lodging, which is when the lower stalk bends, collapses or breaks above ground level. Stalk lodging often increases when plants are stressed, or harvest is delayed, which promotes stalk deterioration. Stalk lodging is usually more prevalent than root lodging, but may be less troublesome because timely harvest might help mitigate issues.

Stalk Integrity: A characterization of the plant's ability to maintain physical integrity after maturity and predict potential harvest issues. Poor stalk integrity typically appears as weak or broken stalks, particularly above the ear, and torn and tattered leaves.

Greensnap: This is a relative rating of resistance to stalk breakage during vegetative growth stages. Corn is most sensitive to this problem during mid to late vegetative growth stages when stalks are rapidly developing, and thus may be brittle and vulnerable to break, if exposed to high winds. The outcome normally severs the stalk below where the ear should develop, so damaged plants rarely produce a viable ear.

Disease Resistance: Disease resistance represents a hybrid's ability to resist infection from a specific pathogen. Southern rust and Curvularia leaf spot were rated based upon disease presence.

Yield Components: Corn grain yield is determined by the total number of kernels produced and kernel weight. Kernel number is comprised by the number of kernel rows an ear produces and the number of kernels per row. Each of these traits are determined during different growth stages. Kernel row number is determined during late vegetative stages and is the first yield component determined. Kernel number is primarily determined during the first few weeks after pollination as young kernels develop until the milk stage. Kernel weight is the final yield component settled and is dependent upon favorable conditions from milk stage until physiological maturity.

Test Weight: Test weight is a measurement of grain bulk density and an indicator of general grain quality. It is a standard component used to assess official grain grade for commercial trade.

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2023 Grain Yield Summary (bu/a)

Irrigated Locations

Brand	Hybrid	Fairview	Inverness	Schlater	Dockery**	Morgan City	Friars Point	MSU** Starkville	**Average Yield***
AgriGold	A647-79	236	244	231	223	221	169	248	**229** BC
DEKALB	DKC66-06	242	248	253	221	190	194	260	**235** B
DEKALB	DKC68-35	249	254	239	234	213	191	269	**242** A
DEKALB	DKC70-45	247	247	254	220	221	179	250	**234** B
Dyna-Gro	D54VC14	239	231	206	206	175	173	225	**211** F
Dyna-Gro	D56TC44	240	239	227	210	184	167	245	**221** DE
Dyna-Gro	D57VC53	241	245	247	211	182	170	245	**224** CDE
Great Heart	HT-7499	214	234	211	214	185	179	244	**218** E
Innvictis	A1689	221	235	226	216	190	192	258	**227** CD
Pioneer	P0953	237	237	232	206	198	153	240	**219** E
Pioneer	P1511	234	243	211	213	209	159	243	**221** DE
Progeny	PGY 2118	239	241	237	214	177	177	248	**224** CDE
Progeny	PGY 2215	239	242	234	204	188	170	238	**220** E
REVERE	1307	237	233	226	213	203	181	246	**224** CDE
REVERE	1627	237	253	243	221	193	198	260	**235** B
Location Average		**237**	**242**	**232**	**215**	**195**	**177**	**248**	**226**
	Soil Type	Brittain silt loam	Dundee silt loam	Dubbs loam	Sharkey clay	Dubbs-Dundee loam	Commerce silty clay	Catalpa silty clay loam	
	Planting Date	24-Mar	24-Mar	23-Mar	18-Apr	13-Apr	18-Apr	19-Apr	

** Grain yields were analyzed and average yield values represented with any combination of the same letter are not significantly different (P < 0.05).*

***Trials at this location were grown with replications of hybrid treatments.*

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Irrigated Entries

2023 Plant Characteristic Ratings

Brand	Hybrid	Days to Tassel	% Grain Moisture	Plant Ht (feet, 10ths)	Ear Ht (feet, 10ths)	Root Strength	Stalk Strength	Stalk Integrity	Southern Rust Resistance	Curvularia Leaf Spot Resistance	Test Wt (lbs/bu)	Yield Components		
												Kernel Rows	Kernels per row	Seed Wt (g/250)
AgriGold	A647-79	63	16.3	9.2	4.4	High	High	High	Medium	Med-Low	60.4	16.0	34.3	86.9
DEKALB	DKC66-06	63	16.6	9.5	4.3	Medium	Med-High	Med-High	Med-Low	High	59.6	16.6	33.7	87.3
DEKALB	DKC68-35	65	16.7	9.1	4.3	High	High	High	Med-Low	High	59.9	16.0	34.1	90.4
DEKALB	DKC70-45	64	18.1	9.5	4.5	High	Medium	Med-High	Med-High	High	60.2	17.1	33.4	92.4
Dyna-Gro	D54VC14	61	15.5	8.8	4.2	Med-Low	Medium	Med-Low	Medium	Low	60.0	15.9	36.9	85.7
Dyna-Gro	D56TC44	63	15.1	9.4	4.3	Medium	Medium	Low	Med-High	Very Low	59.8	15.9	36.0	81.1
Dyna-Gro	D57VC53	63	17.6	9.0	4.3	Medium	High	High	Medium	Medium	60.9	17.7	32.1	86.5
Great Heart	HT-7499	63	17.4	9.2	4.5	Medium	Medium	Med-Low	Med-High	Med-High	59.0	15.5	33.7	87.1
Innvictis	A1689	63	16.3	9.2	4.3	Med-Low	Medium	High	Medium	Med-High	60.5	16.4	31.3	93.2
Pioneer	P0953	65	14.6	9.2	4.1	Low	Medium	Med-Low	Med-High	High	59.0	15.8	36.7	78.8
Pioneer	P1511	64	18.3	9.2	4.5	Medium	Med-High	Medium	Med-High	Med-High	58.5	15.4	36.2	83.1
Progeny	PGY 2118	63	17.7	9.1	4.3	Medium	High	High	Medium	Medium	60.8	17.5	32.7	87.2
Progeny	PGY 2215	63	16.3	9.6	4.4	Med-High	Med-High	Med-High	Medium	Med-High	60.0	15.0	34.3	85.8
REVERE	1307	62	15.8	9.0	4.4	Medium	Medium	Med-Low	Med-Low	Med-Low	58.9	16.3	34.5	85.9
REVERE	1627	63	16.8	9.4	4.4	Med-Low	Medium	Med-High	Med-High	Medium	59.6	16.4	32.6	89.2
		63	**16.6**	**9.2**	**4.3**						**59.8**	**16.2**	**34.2**	**86.7**

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2023 Grain Yield Summary (bu/a)

Dryland Locations

Brand	Hybrid	Natchez	Artesia 30K Pop	Artesia 36K Pop	Utica	Brown Loam	Green-wood	Strong	Ponto-toc	Ponto-toc Sta	NMREC Verona	MSU** Starkville	**Average Yield***
AgriGold	A643-52	199	216	225	146	151	150	163	155	179	147	212	**182** F
DEKALB	DKC66-06	244	227	230	142	164	153	212	221	207	173	235	**206** AB
DEKALB	DKC68-35	250	240	261	148	165	156	218	193	216	157	256	**213** A
DEKALB	DKC70-45	244	229	244	129	167	177	183	180	210	165	238	**203** BC
Dyna-Gro	D54VC14	237	216	234	141	128	176	197	184	201	156	218	**194** CD
Dyna-Gro	D56TC44	211	231	233	133	151	164	208	222	195	137	208	**193** D
Dyna-Gro	D58VC65	237	209	207	117	162	159	190	180	190	149	216	**188** DEF
Great Heart	HT-7317	203	211	212	127	133	164	173	157	172	145	227	**183** F
Innvictis	A1551	234	217	233	143	158	171	140	211	198	128	233	**195** CD
Pioneer	P0953	200	218	235	141	141	155	150	197	192	125	243	**191** DEF
Pioneer	P1170	201	219	233	129	163	166	185	192	185	135	243	**195** CD
Progeny	PGY 9114	227	210	223	142	150	166	186	203	201	146	223	**194** CD
Progeny	PGY 2215	215	207	214	121	142	151	175	166	175	142	220	**182** F
REVERE	1307	235	210	221	155	153	170	154	184	205	152	220	**192** DE
REVERE	1627	226	240	233	146	181	178	188	211	210	150	256	**210** AB
Location Average		**224**	**220**	**229**	**137**	**154**	**164**	**182**	**190**	**196**	**147**	**230**	**195**
	Soil Type	Adler silt loam	Okolona silty clay	Okolona silty clay	Calloway silt loam	Loring silt loam	Adler silt loam	Vaiden silty clay	Iuka loam	Falkner silt loam	Marietta loam	Leeper silty clay loam	
	Planting Date	24-Mar	24-Apr	24-Apr	24-Apr	12-Apr	18-Apr	25-Apr	18-Apr	18-Apr	17-Apr	19-Apr	

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REVERE	1627	63	18.3	9.3	4.3	Med-High	Med-High	Medium	Med-High	Med-High	58.9	16.4	32.9	88.4
		63	**17.7**	**9.2**	**4.3**						**58.8**	**15.9**	**34.0**	**86.4**

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