MISSISSIPPI STATE UNIVERSITY EXTENSION

2021 Extension Corn Hybrid Demonstration Program Results

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Program Objectives: The MSU Extension Corn Hybrid Demonstration Program is intended to provide corn growers, crop consultants, and other agricultural professionals a firsthand opportunity to observe performance of elite hybrids and generate information to better assess hybrid 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 hybrid adaptability. Seed companies are granted the discretion to enter hybrids that 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 that 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.

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 that may affect light interception, which is critical to photosynthesis and grain yield. Short plant height may reduce 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 more 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. Root lodging occurs when the force caused by wind exceeds the roots' ability to stabilize plants and keep them erect, particularly if the soil is moist and soft. Thus, the entire stalk leans or completely falls to ground level, often dislodging part of the root system from the soil. This may promote a "domino effect," causing lodging in sizable portions of a field. Root lodging normally occurs as plants approach physiological maturity, since the mass of the plant is greatest at this time. Root lodging may considerably hinder harvest efficiency because plants lay nearly flat on the ground and are often partially uprooted from the soil, making stalks difficult to gather and flow into a combine.

Stalk Integrity: This is a characterization of the plant's ability to maintain physical integrity after physiological maturity. Poor stalk integrity typically appears as weak or broken stalks, particularly above the ear, and shriveled, shredded, or dislodged leaves. Late-season stress and adverse weather often promote plant deterioration during the time between physiological maturity and harvest.

Greensnap: This is a relative rating of resistance to stalk breakage during vegetative development stages. Greensnap is more likely to occur during mid to late vegetative growth stages when stalks are rapidly developing and may be brittle and vulnerable to breakage if exposed to high winds. Breaks normally occur on the stalk below where the ear should develop. Thus, 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, Curvularia leaf spot, and southern corn leaf blight were rated based on degree of disease presence.

Yield Components: Corn grain yield is determined by the total number of kernels produced and kernel weight. Kernel number is the number of kernel rows an ear produces and the number of kernels per row. Each of these traits are determined during different growing stages. Kernel row number is determined during late vegetative stages and is the first yield component determined by the plant. 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 determined and is largely 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.

2021 Grain Yield Summary (bushels per acre)

Irrigated Locations

Brand	Hybrid	Morgan City	Inverness	Shaw	Schlater	MSU*	Vance	Greenwood	Friars Point	Average yield**
AgriGold	A6544	277	238	195	251	250	195	190	242	234 CDE
AgriGold	A645-16	263	260	205	256	246	198	200	257	238 ABC
AgriGold	A6659	276	240	204	242	251	207	191	276	239 ABC
CROPLAN	5678	278	243	205	256	253	209	211	248	241 AB
DEKALB	DKC65-99	273	252	207	257	253	217	192	260	242 A
DEKALB	DKC69-99	265	247	208	252	243	204	197	248	235 CD
DEKALB	DKC70-27	268	241	198	254	251	215	201	267	240 ABC
Dyna-Gro	D54VC34	274	232	203	247	244	190	169	233	228 EF
Dyna-Gro	D55VC80	262	259	188	247	246	199	194	251	234 CDE
Great Heart	HT-7337	264	226	188	229	234	194	188	238	223 F
Local Seed	LC1707	266	228	205	249	237	197	201	258	232 DE
Local Seed	LC1898	259	243	202	243	242	212	210	256	235 BCD
Innvictis	A1857	268	241	197	239	233	205	202	247	230 DE
Pioneer	P1870	268	231	193	242	249	213	194	258	235 CD
Progeny	PGY 2118	273	240	211	246	243	211	189	238	234 CDE
Location avg.		**269**	**241**	**201**	**247**	**245**	**204**	**195**	**252**	**234**

*Trials at MSU were grown with three replications of hybrid treatments.

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

Irrigated Cultural Information

Location	Soil Type	Planting Date
Morgan City	Dundee loam	12-Mar
Inverness	Forestdale silt loam	7-Apr
Shaw	Alligator silty clay	21-Apr
Schlater	Dubbs loam	13-Apr
MSU	Marietta sandy loam	16-Apr
Vance	Dundee silt loam	20-Apr
Greenwood	Adler silt loam	28-Apr
Friars Point	Dundee silty clay	20-Apr

2021 Plant Characteristic Ratings

Irrigated Locations

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	Southern Corn Leaf Blight Resistance	Test Wt (lbs/bu)	Kernel Rows	Kernels per row	Seed Wt (g/250)
AgriGold	A6544	66	17.8	9.0	3.9	Medium	Med-Low	Med-Low	Med-High	High	High	58.3	16.1	32.0	90.6
AgriGold	A645-16	67	18.7	9.2	4.2	High	Med-High	High	Medium	Medium	Med-Low	59.2	15.6	28.4	96.4
AgriGold	A6659	68	18.5	9.1	4.1	High	Med-High	High	Med-High	Medium	Medium	59.6	14.4	32.0	97.2
CROPLAN	5678	66	18.2	8.7	3.8	High	Medium	Medium	Med-Low	Med-Low	High	60.1	15.5	33.2	94.7
DEKALB	DKC65-99	67	18.1	8.4	3.7	High	High	High	High	Med-Low	Medium	59.6	16.7	30.5	93.2
DEKALB	DKC69-99	67	19.0	9.0	4.3	Med-High	Med-Low	Med-High	Med-Low	Med-High	Med-High	61.0	15.5	28.9	95.0
DEKALB	DKC70-27	68	20.1	9.2	4.2	Med-High	Medium	Med-High	Med-High	Med-High	Med-Low	59.6	16.8	30.2	93.0
Dyna-Gro	D54VC34	67	18.3	9.2	4.1	Med-High	Low	Low	Low	Medium	Medium	59.7	15.0	33.0	100.3
Dyna-Gro	D55VC80	67	19.1	9.1	4.2	Med-Low	Med-High	Medium	Med-High	Med-High	Med-Low	58.9	15.4	31.1	96.5
Great Heart	HT-7337	67	18.3	9.2	4.1	Med-High	Med-High	Med-Low	Medium	Medium	High	58.9	14.6	33.7	86.5
Local Seed	LC1707	68	19.2	8.8	4.1	Med-Low	Medium	Medium	Med-Low	Med-Low	Medium	61.1	16.8	30.4	88.2
Local Seed	LC1898	67	17.8	8.9	4.0	High	High	High	Medium	Medium	Medium	60.4	15.6	28.7	97.4
Innvictis	A1857	67	17.5	8.7	4.0	Med-High	High	Med-Low	Med-High	Medium	Low	60.4	16.5	31.1	91.0
Pioneer	P1870	68	19.8	9.2	4.2	Low	Med-High	Med-Low	Medium	Medium	Medium	59.6	16.1	34.3	86.5
Progeny	PGY 2118	68	18.9	8.9	4.1	Med-Low	Med-Low	Medium	Med-Low	Med-Low	Med-Low	60.9	16.9	30.5	88.4
Average		**67**	**18.6**	**9.0**	**4.1**							**59.8**	**15.8**	**31.2**	**93.0**

2021 Grain Yield Summary (bushels per acre)

Dryland Locations

Brand	Hybrid	Canton	Natchez	Calhoun City	Ray-mond	Green-wood	Artesia Low Pop	Artesia High Pop	Pontotoc Exp Sta	NMREC	MSU*	Pontotoc	Shell-mound	Strong	Average Yield**
AgriGold	A6544	223	212	197	185	183	220	233	173	172	221	175	163	212	201 AB
AgriGold	A645-16	172	226	186	210	172	216	234	142	183	224	175	167	206	198 ABC
AgriGold	A6659	114	201	200	186	173	212	229	168	187	224	174	166	218	193 ABCD
CROPLAN	5335	188	196	197	180	176	197	237	158	179	207	183	165	215	193 ABCD
DEKALB	DKC65-99	143	234	204	206	161	211	243	164	193	225	221	167	229	204 A
DEKALB	DKC68-69	90	229	193	197	191	212	241	176	198	229	182	156	218	198 ABC
DEKALB	DKC69-99	92	225	198	178	202	214	239	163	199	229	197	168	224	199 AB
Dyna-Gro	D54VC34	213	200	198	188	155	208	235	163	188	214	194	180	214	198 ABC
Great Heart	HT-7425	193	188	177	166	171	185	209	158	177	208	149	166	198	184 D
Local Seed	LC1307	185	209	194	169	175	198	223	160	178	207	140	176	212	189 BCD
Local Seed	LC1898	81	219	191	196	179	210	217	157	182	220	196	182	207	192 ABCD
Innvictis	A1857	133	201	193	160	176	207	224	172	180	208	174	156	203	187 CD
Pioneer	P1464	209	208	196	174	152	208	230	175	170	225	169	155	205	195 ABCD
Progeny	PGY 8116	158	195	183	159	170	201	216	161	175	213	137	174	191	184 D
Progeny	PGY 9114	208	179	200	202	171	211	232	169	165	226	182	179	203	199 AB
Location Average		**160**	**208**	**194**	**184**	**174**	**207**	**229**	**164**	**182**	**219**	**177**	**168**	**210**	**194**

*Trials at MSU were grown with three replications of hybrid treatments.

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

Dryland Cultural Information

Location	Soil Type	Planting Date
Canton	Loring silt loam	7-Apr
Natchez	Convent silt loam	13-Mar
Calhoun City	Falaya sandy loam	21-Apr
Raymond	Loring silt loam	29-Apr
Greenwood	Adler silt loam	28-Apr
Artesia Low Pop	Okolona silty clay	21-Apr
Artesia High Pop	Okolona silty clay	21-Apr
Pontotoc Exp Sta	Falkner silt loam	19-Apr
NMREC	Leeper silty clay	5-Apr
MSU	Leeper silty clay loam	15-Apr
Pontotoc	Iuka sandy loam	17-Apr
Shellmound	Dubbs loam	28-Apr
Strong	Vaiden silty clay	22-Apr

2021 Plant Characteristic Ratings

Dryland Locations

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AgriGold	A6544	66	16.9	8.7	3.8	Medium	Medium	High	Medium	High	High	58.3	16.1	35.1	87.7
AgriGold	A645-16	67	17.0	8.8	4.0	High	High	High	Med-High	Med-High	Low	59.0	15.9	30.7	95.5
AgriGold	A6659	68	17.6	8.7	3.9	High	High	Low	Med-High	Medium	Medium	59.4	14.6	32.8	95.3
CROPLAN	5335	66	16.5	8.5	3.7	Medium	Med-High	High	Medium	Medium	Low	59.5	16.8	30.8	91.0
DEKALB	DKC65-99	67	16.7	8.3	3.6	High	High	Med-Low	High	Medium	Medium	59.9	16.9	30.0	92.5
DEKALB	DKC68-69	68	18.4	9.0	4.1	Med-High	High	Low	Med-High	Medium	Med-High	60.5	16.3	30.4	96.8
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Dyna-Gro	D54VC34	67	15.4	8.9	3.9	Med-Low	Low	Med-High	Medium	Med-Low	Low	59.5	15.1	30.9	94.0
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Pioneer	P1464	66	16.2	9.1	4.2	Low	Low	High	Med-Low	High	Med-High	58.9	15.8	34.7	86.7
Progeny	PGY 8116	68	16.3	8.8	4.2	Low	Med-Low	Med-Low	Med-Low	Med-High	Med-Low	61.0	17.4	32.2	86.3
Progeny	PGY 9114	65	15.9	8.6	3.7	Low	Med-Low	High	Medium	Low	High	60.4	15.2	34.5	91.6
Average		**67**	**16.5**	**8.7**	**4.0**							**59.7**	**16.0**	**31.9**	**91.7**

Publication 3695 (POD-05-22)

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MISSISSIPPI STATE UNIVERSITY EXTENSION

Produced by Agricultural Communications.

Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director