2021 Corn Hybrid Demonstration Program Results

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Grower Cooperators: Brown Farms, Dantzler Pilkinton and Phillips Farm, Dunn Farms, Guedon Farms, Harlow Farms, David Hey, Hopeso Farms, Long Lake Farms, Danny Mashburn, Murphy Farms, Parker Brother's Farm, Matthew Poe, Pushen and Pullen Farms, Shellmound Farms, and Steve Skelton.

Program Objectives: The Corn Hybrid Demonstration Program is intended to provide corn growers, crop consultants and other agricultural professionals a first-hand 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 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 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 key 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 an elevation 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: 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 a plant and keep it erect. Thus, the entire stalk leans or completely falls to ground level, 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 harvest is delayed by rainy weather, 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 to resist 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. 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 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 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.

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2021 Grain Yield Summary (bu/a)

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 Average		**269**	**241**	**201**	**247**	**245**	**204**	**195**	**252**	**232**
Soil Type		Dundee loam	Forestdale silt loam	Alligator silty clay	Dubbs loam	Marietta sandy loam	Dundee silt loam	Adler silt loam	Dundee silty clay	
Planting Date		12-Mar	7-Apr	21-Apr	13-Apr	16-Apr	20-Apr	28-Apr	20-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 MSU were grown with three replications of hybrid treatments.*

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Irrigated Entries

2021 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	Southern Corn Leaf Blight Resistance	Test Wt (lbs/bu)	Yield Components		
													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
		67	**18.6**	**9.0**	**4.1**							**59.8**	**15.8**	**31.2**	**93.0**

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2021 Grain Yield Summary (bu/a)

Dryland Locations

Brand	Hybrid	Canton	Natchez	Calhoun City	Ray-mond	Green-wood	Artesia Low Pop	Artesia High Pop	Ponto-toc Exp Sta	NMREC	MSU**	Ponto-toc	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**
Soil Type		Loring silt loam	Convent silt loam	Falaya sandy loam	Loring silt loam	Adler silt loam	Okolona silty clay	Okolona silty clay	Falkner silt loam	Leeper silty clay	Leeper silty clay loam	Iuka sandy loam	Dubbs loam	Vaiden silty clay	
Planting Date		7-Apr	13-Mar	21-Apr	29-Apr	28-Apr	21-Apr	21-Apr	19-Apr	5-Apr	15-Apr	17-Apr	28-Apr	22-Apr	

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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
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