

2019 Corn Hybrid Demonstration Program Results

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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 Mississippi's production systems.

Program Methodology: Hybrids selected for 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 significantly affect hybrid adaptability. Seed companies are granted the discretion to enter the hybrid which has demonstrated superior performance in the Mississippi Corn for Grain Hybrid Trials, or a newly-released hybrid which they feel 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 during the season.

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 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.

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 can mediate issues. Also, this type of lodging may enable more opportunity for a combine to gather stalks, compared to root lodging.

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

Greensnap: This is a relative rating to resist greensnap, which is an issue where corn stalks are completely broken off by high winds. This usually occurs during mid to late vegetative growth stages when the stalks are rapidly developing and may be brittle and vulnerable to break, if exposed to high wind. These damaged stalks normally break below where the ear should develop. Thus, damaged plants rarely produce a viable ear.

Wind Lodging Resistance: An evaluation of a hybrid's ability to resist lodging induced by wind during vegetative growth stages. Wind lodging is very similar to root lodging, but this type of lodging occurs during mid-vegetative stages, prior to brace root development. Plants generally try to re-assume vertical orientation within a few days of lodging, however stalks will likely suffer goose-necking near ground-level, where they cannot fully straighten. This characteristic is distinctively different from greensnap, which may also occur during similar growth stages.

Disease Resistance: Disease resistance refers to a hybrid's ability to resist infection from a specific pathogen. Curvularia leaf spot was rated during 2019 based upon increasing degree of 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 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 dough 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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MSU Corn Hybrid Demonstration Program

2019 Grain Yield Summary (bu/a)

Irrigated Locations

Brand	Hybrid	Shaw	Itta Bena	Belzoni	Fairview	Metcalfe	Schlater	Boyle	Pontotoc	MSU	Average Yield*
AgriGold	A6544	255	262	178	217	201	182	185	169	168	202 BCD
AgriGold	A6659	251	261	181	206	210	175	183	178	202	205 ABC
Armor	1447	238	262	174	190	201	183	177	180	179	198 BCDE
Croplan	5678	250	255	178	212	190	195	186	171	183	202 BCD
DEKALB	DKC67-44	246	272	168	221	203	187	185	194	217	211 A
DEKALB	DKC68-69	253	268	167	210	222	200	190	187	204	211 A
DEKALB	DKC70-27	254	279	191	226	203	182	189	172	204	211 A
Dyna-Gro	D54VC14	243	260	174	214	212	190	172	177	173	202 BCD
Dyna-Gro	D58VC65	257	266	175	205	184	194	177	186	184	203 ABC
Local Seed	LC1577	251	254	173	191	193	177	157	175	177	194 DE
Mission	A1687	233	244	158	194	191	197	177	165	179	193 E
Pioneer	P1870	234	261	183	215	198	204	163	175	199	203 ABC
Terral	24BHR99	243	251	188	207	185	197	170	163	188	199 BCDE
Terral	26BHR30	242	269	168	207	211	207	171	184	197	206 AB
Terral	28BHR18	232	258	169	203	190	185	167	173	203	198 CDE
Location Average		245	261	175	208	200	190	177	177	190	203
Soil Type		Dundee silt loam	Dundee loam	Alligator clay	Brittain silt loam	Commerce silt loam	Dubbs loam	Forestdale silt loam	Adaton silt loam	Marietta fine sandy loam	
Planting Date		3/24/2019	4/22/2019	3/28/2019	3/21/2019	4/3/2019	3/29/2019	4/1/2019	4/24/2019	4/3/2019	

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



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Irrigated Entries

2019 Plant Characteristic Ratings

Brand	Hybrid	Days to Tassel	% Grain Moisture	Plant Ht (feet, 10ths)	Ear Ht (feet, 10ths)	Stalk Strength	Stalk Integrity	Wind Lodging Resistance	Curvularia leaf spot Resistance	Test Wt (lbs/bu)	Yield Components		
											Kernel Rows	Kernels per row	Seed Wt (g/250)
AgriGold	A6544	65	17.4	8.2	3.4	Medium	Low	Med-Low	High	58.9	16.3	36.1	80.5
AgriGold	A6659	68	18.2	8.9	3.9	High	Med-High	Medium	Med-Low	59.7	14.7	37.7	83.1
Armor	1447	63	16.7	8.6	3.7	Medium	Low	Med-Low	Low	60.2	16.2	38.4	83.1
Croplan	5678	65	17.8	8.6	3.7	High	Med-Low	Medium	Medium	60.2	15.8	35.5	86.4
DEKALB	DKC67-44	65	17.3	8.9	3.7	High	Med-High	High	Med-High	60.0	16.0	36.3	79.2
DEKALB	DKC68-69	66	19.0	9.2	4.0	High	High	Medium	Med-High	60.4	16.1	33.1	85.6
DEKALB	DKC70-27	67	19.3	8.8	3.8	High	High	Medium	Med-High	59.5	16.7	33.8	88.1
Dyna-Gro	D54VC14	64	16.8	8.2	3.4	Medium	Low	Med-Low	Low	60.1	15.5	37.0	82.9
Dyna-Gro	D58VC65	64	17.6	8.6	3.8	High	Med-Low	Medium	Medium	60.2	15.6	34.8	86.2
Local Seed	LC1577	65	16.4	8.3	3.7	Medium	Low	Medium	Low	60.2	15.6	36.8	83.0
Mission	A1687	66	17.7	8.5	3.8	Med-High	Medium	Medium	Low	59.6	15.3	35.2	89.7
Pioneer	P1870	67	19.1	8.9	4.0	High	High	High	Med-High	59.5	16.8	38.2	75.0
Terral	24BHR99	66	17.9	8.7	3.8	Med-High	Med-Low	Medium	Med-High	59.0	15.6	34.7	82.1
Terral	26BHR30	65	18.0	8.9	3.9	Medium	Med-Low	High	High	60.4	17.3	38.9	76.6
Terral	28BHR18	68	19.4	9.2	4.0	Medium	Medium	Med-Low	High	59.2	17.4	38.7	78.4
		66	17.9	8.7	3.8					59.8	16.1	36.4	82.7



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2019 Grain Yield Summary (bu/a)

Dryland Locations

Brand	Hybrid	Canton	Artesia Low Pop	Artesia High Pop	Muldon	MSU	Pontotoc	Shell- mound	NMREC	Average Yield*
AgriGold	A644-32	181	155	164	195	196	171	121	189	171 BCDE
AgriGold	A6659	178	168	173	208	181	203	117	207	179 AB
Armor	1447	193	155	175	192	197	192	120	174	175 BC
Croplan	5678	180	162	160	202	171	190	109	190	170 CDE
DEKALB	DKC67-44	187	170	191	213	197	202	126	195	185 A
DEKALB	DKC68-69	183	151	171	213	172	215	111	195	176 BC
DEKALB	DKC70-27	159	158	163	200	187	200	108	190	171 CDE
Dyna-Gro	D54VC14	174	164	163	209	190	193	122	191	176 BC
Dyna-Gro	D58VC65	185	147	165	196	172	190	118	191	171 CDE
Local Seed	LC1577	190	158	175	200	193	193	114	153	172 BCD
Pioneer	P1464	182	167	167	197	194	199	122	188	177 ABC
Terral	24BHR99	169	144	156	198	178	185	97	178	163 E
Terral	28BHR18	167	146	155	193	184	175	119	170	164 DE
Location Average		179	157	168	201	185	193	116	185	173
Soil Type		Falkner silt loam	Okolona silty clay	Okolona silty clay	Tensas silty clay loam	Sumter silty clay	Leeper silty clay loam	Vicksburg silt loam	Houston clay	
Planting Date		5/2/2019	5/2/2019	5/2/2019	5/1/2019	4/24/2019	4/24/2019	5/2/2019	4/23/2019	

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

MSU Corn Hybrid Demonstration Program

Dryland Entries

2019 Plant Characteristic Ratings

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											Kernel Rows	Kernels per row	Seed Wt (g/250)
AgriGold	A644-32	59	16.2	8.4	3.9	Low	Medium	Medium	Medium	59.7	14.9	34.2	82.7
AgriGold	A6659	61	17.2	8.1	3.8	High	High	Low	Medium	59.5	14.3	36.7	88.7
Armor	1447	58	15.4	7.8	3.9	Medium	Med-Low	High	Low	59.8	14.8	37.0	82.1
Croplan	5678	59	16.0	7.9	3.9	High	Medium	Low	Medium	60.3	14.5	34.7	91.2
DEKALB	DKC67-44	60	15.9	8.4	3.9	High	High	Med-High	Med-High	60.3	15.0	35.3	82.1
DEKALB	DKC68-69	62	18.0	8.8	4.0	Med-High	High	Low	Medium	60.8	15.3	33.6	88.1
DEKALB	DKC70-27	62	18.1	8.4	3.7	High	High	Med-High	High	59.3	16.2	33.4	83.9
Dyna-Gro	D54VC14	58	16.0	7.9	3.8	Medium	Med-Low	High	Low	59.7	14.4	35.0	80.2
Dyna-Gro	D58VC65	60	16.1	7.9	3.9	High	Medium	Low	Medium	60.3	14.5	34.9	89.0
Local Seed	LC1577	59	15.5	8.0	3.8	Medium	Med-Low	High	Low	59.8	14.9	36.7	82.0
Pioneer	P1464	62	16.3	8.6	4.1	Med-Low	Low	High	High	59.4	15.3	37.1	76.6
Terral	24BHR99	61	16.0	8.5	4.0	High	Medium	High	Med-High	58.9	14.4	34.4	80.7
Terral	28BHR18	62	18.3	8.8	4.2	High	Med-High	High	High	59.3	16.6	37.1	75.4
		60	16.4	8.2	3.9					59.8	14.9	35.2	83.9

