2018 Corn Hybrid Demonstration Program Results

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Program Summary: 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 Summary: 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 actively drying at harvest - in other words, those plots harvested within 30 days of attaining physiological maturity.

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.

Root Strength: 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 from 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 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.

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.

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

2018 Grain Yield Summary (bu/a)

Irrigated Locations

Brand	Hybrid	Shaw	Sunflower	Fairview	Belzoni	Itta Bena	Avon	Schlater	Webb	MSU	Average Yield*
AgriGold	A6544	227	219	229	242	229	242	238	257	237	**236** B
AgriGold	A6659	240	219	232	248	226	225	240	269	240	**238** B
Armor	1447PRO2	216	213	215	226	224	217	240	250	222	**225** C
Augusta	5065	221	211	228	237	206	239	202	240	221	**223** CD
Augusta	8868	203	187	208	221	206	228	223	231	219	**214** D
Croplan	5678VT2P	229	229	213	238	231	228	238	263	236	**234** B
DEKALB	DKC64-35	240	218	238	239	216	240	244	261	240	**237** B
DEKALB	DKC67-44	240	230	234	235	231	218	224	256	241	**234** B
DEKALB	DKC70-27	244	235	256	259	227	263	253	262	250	**250** A
Dyna-Gro	57VC51	229	222	233	230	234	214	238	262	244	**234** B
Dyna-Gro	58VC65	228	211	232	242	228	234	236	264	236	**235** B
Local Seed	LC1577 VT2P	200	204	202	205	214	217	218	242	226	**214** D
Pioneer	P2089VYHR	254	189	218	215	219	210	192	242	207	**216** CD
Progeny	PGY 8116	208	202	204	219	208	214	227	231	238	**217** CD
	Location Average	**227**	**213**	**224**	**233**	**221**	**228**	**230**	**252**	**233**	**229**
	Soil Type	Forrestdale silt loam	Dundee silt loam	Forrestdale silt loam	Forrestdale silty clay	Dundee loam	Commerce silty clay loam	Dubbs loam	Dubbs v fine sandy loam	Marietta fine sandy loam	
	Planting Date	22-Mar	22-Mar	22-Mar	25-Mar	26-Mar	26-Mar	11-Apr	20-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).*

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Irrigated Entries

2018 Plant Characteristic Ratings

Brand	Hybrid	Days to Tassel	% Grain Moisture	Plant Ht (feet, 10ths)	Ear Ht (feet, 10ths)	Root Strength	Stalk Strength	Stalk Integrity	Wind Lodging Resistance	Test Wt (lbs/bu)	Yield Components		
											Kernel Rows	Kernels per row	Seed Wt (g/250)
AgriGold	A6544	59	17.1	9.1	4.1	Medium	Med-High	Med-Low	Low	57.8	16.5	40.7	82.6
AgriGold	A6659	61	18.3	9.0	4.0	High	Very High	High	Medium	59.0	14.9	39.3	85.0
Armor	1447PRO2	58	16.7	8.2	3.9	Med-High	Med-High	Low	Med-Low	59.4	15.5	39.8	82.0
Augusta	5065	60	19.2	9.9	4.2	Med-Low	High	Medium	High	59.0	16.7	37.2	79.7
Augusta	8868	59	18.8	9.9	4.5	High	High	Med-High	Medium	57.0	16.6	35.7	90.2
Croplan	5678	60	17.9	8.6	4.0	Med-High	High	Med-High	Medium	59.2	15.9	39.6	87.6
DEKALB	DKC64-35	60	16.7	9.2	4.3	Very High	Very High	Med-High	Very High	59.7	18.1	37.6	79.4
DEKALB	DKC67-44	60	18.3	9.2	4.4	Low	Med-High	Medium	High	58.8	16.2	37.1	82.1
DEKALB	DKC70-27	61	19.4	9.1	4.4	High	Very High	High	High	58.9	17.2	34.9	85.0
Dyna-Gro	D57VC51	61	18.7	8.7	4.0	High	Very High	High	Medium	58.7	15.5	40.4	86.4
Dyna-Gro	D58VC65	60	18.1	8.7	3.9	Med-High	High	Med-High	Medium	59.5	16.4	35.7	87.2
Local Seed	LC1577 VT2P	59	16.9	8.4	3.9	Very High	High	Med-Low	Med-Low	59.4	16.2	42.4	87.1
Pioneer	P2089VYHR	59	19.7	10.1	4.6	Low	Low	Low	Medium	56.4	15.9	40.8	80.7
Progeny	PGY 8116	61	18.6	8.9	4.4	High	Med-High	Medium	Med-High	60.0	16.9	37.6	83.0
	Average	**60**	**18.2**	**9.1**	**4.2**					**58.8**	**16.3**	**38.5**	**84.1**

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2018 Grain Yield Summary (bu/a)

Dryland Locations

Brand	Hybrid	West Point	Pontotoc	Canton	Bolton	Verona	Mississippi State	Shell-mound	**Average Yield***
AgriGold	A6544	197	179	181	172	207	217	150	**185** AB
AgriGold	A6659	193	159	172	185	231	236	148	**195** A
Armor	1447PRO2	182	159	203	159	208	222	167	**192** AB
Croplan	5335VT2P	178	165	197	142	201	221	145	**181** ABC
DEKALB	DKC64-35	179	176	174	159	223	230	150	**187** AB
DEKALB	DKC67-44	186	172	219	158	222	233	129	**192** A
DEKALB	DKC70-27	190	150	168	173	227	229	160	**191** AB
Dyna-Gro	D57VC51	180	152	200	166	229	224	148	**193** AB
Dyna-Gro	D58VC65	205	177	179	174	223	224	158	**191** A
Local Seed	LC1577 VT2P	196	158	171	127	200	206	162	**173** BC
Pioneer	P0805AM	182	167	164	154	189	203	129	**168** C
Progeny	PGY 6116	163	149	162	172	213	198	157	**181** BC
	Location Average	**186**	**164**	**182**	**162**	**214**	**220**	**150**	**186**
	Soil Type	Griffith silty clay	Bude silt loam	Oaklimiter silt loam	Riedtown silt loam	Leeper silty clay loam	Leeper silty clay loam	Tensas silty clay loam	
	Planting Date	3/26/2018	4/3/2018	4/12/2018	4/12/2018	4/13/2018	4/13/2018	4/20/2018	

** 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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Dryland Entries

2018 Plant Characteristic Ratings

Brand	Hybrid	Days to Tassel	% Grain Moisture	Plant Ht (feet, 10ths)	Ear Ht (feet, 10ths)	Root Strength	Stalk Strength	Stalk Integrity	Wind Lodging Resistance	Test Wt (lbs/bu)	Yield Components		
											Kernel Rows	Kernels per row	Seed Wt (g/250)
AgriGold	A6544	64	15.6	8.7	4.2	Med-Low	Med-Low	Med-Low	Low	57.9	16.3	36.8	77.6
AgriGold	A6659	65	15.6	8.8	4.3	High	Med-High	Medium	Medium	58.7	14.6	36.4	84.0
Armor	1447PRO2	63	15.1	8.5	4.2	Medium	High	Med-Low	Medium	59.5	15.6	38.4	78.8
Croplan	5335VT2P	65	15.1	8.8	4.2	High	High	High	Med-High	58.5	16.5	34.2	77.2
DEKALB	DKC64-35	65	15.3	8.8	4.2	High	High	Med-High	Very High	59.5	16.7	35.8	76.3
DEKALB	DKC67-44	64	16.5	9.0	4.2	Low	Med-High	High	High	59.1	15.7	34.5	78.2
DEKALB	DKC70-27	66	16.9	8.8	4.2	High	High	High	High	59.0	16.2	32.5	80.4
Dyna-Gro	D57VC51	66	15.7	8.7	4.2	High	Med-High	Medium	Med-High	58.7	15.4	38.4	83.1
Dyna-Gro	D58VC65	65	15.8	8.4	4.0	High	High	Med-High	Med-High	59.5	16.1	37.0	81.8
Local Seed	LC1577 VT2P	64	15.2	8.5	3.9	Medium	Med-High	Med-Low	Medium	58.9	15.2	38.3	80.3
Pioneer	P0805AM	61	14.6	9.2	4.0	Low	Med-High	Low	Very Low	59.9	16.1	36.5	72.1
Progeny	PGY 6116	64	16.0	8.4	4.1	High	High	Medium	Very Low	58.1	15.4	35.7	80.2
	Average	**64**	**15.6**	**8.7**	**4.1**					**58.9**	**15.8**	**36.2**	**79.2**

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