

2020 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 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 which 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. MAFES scientists also grow some trials on experiment 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 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 Integrity: 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 to resist 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 thus may be brittle and vulnerable to break, if exposed to storms containing high winds. The outcome normally breaks 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 and Curvularia leaf spot were rated during 2020 based upon 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 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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MSU Corn Hybrid Demonstration Program

2020 Grain Yield Summary (bu/a)

Irrigated Locations

Brand	Hybrid	Itta Bena	Shaw	Greenwood	MSU	Philipp	Pontotoc	Stoneville	Average Yield*
AgriGold	A6544	241	239	219	215	221	184	151	210 BCDEFG
AgriGold	A6659	232	240	212	241	211	186	199	217 ABC
DEKALB	DKC65-99	239	246	216	218	222	205	198	221 AB
DEKALB	DKC67-44	247	243	222	231	232	197	214	226 A
DEKALB	DKC70-27	232	239	207	229	227	191	186	216 BC
Dyna-Gro	D55VC80	214	234	211	215	208	197	191	210 CDEFG
Dyna-Gro	D58VC65	242	239	204	214	223	180	172	210 BCDEF
Great Heart	HT-7425	221	224	195	216	201	184	191	205 DEFG
Local Seed	LC1898	236	240	212	224	221	192	192	217 ABC
Local Seed	LC1987	226	227	208	211	230	196	197	214 BCDE
Mission	A1548DG	212	227	190	206	198	185	208	204 EFG
Pioneer	P1077	215	236	187	210	207	163	189	201 FG
Pioneer	P1870	223	235	203	226	213	180	223	215 BCD
Progeny	PGY 2015	216	221	185	195	217	179	185	200 G
Location Average		228	235	205	218	216	187	192	212
Soil Type		Tensas silty clay loam	Alligator silty clay	Adler silt loam	Marietta sandy loam	Dubbs loam	Falkner silt loam	Commerce very fine sandy loam	
Planting Date		6-Apr	4-May	11-Apr	28-Apr	28-Apr	27-Apr	28-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

2020 Plant Characteristic Ratings

Brand	Hybrid	Days to Tassel	% Grain Moisture	Plant Ht (feet, 10ths)	Ear Ht (feet, 10ths)	Root Strength	Stalk Integrity	Greensnap Resistance	Southern rust Resistance	Curvularia leaf spot Resistance	Test Wt (lbs/bu)	Yield Components		
												Kernel Rows	Kernels per row	Seed Wt (g/250)
AgriGold	A6544	64	16.7	8.0	3.7	Med-Low	Med-Low	Med-High	Med-High	Med-High	58.5	16.1	36.4	88.3
AgriGold	A6659	67	17.7	8.2	3.7	High	High	Low	Med-High	Med-Low	59.3	14.8	35.2	94.5
DEKALB	DKC65-99	66	17.8	7.8	3.5	High	Medium	Med-Low	High	Med-Low	58.4	16.9	31.9	92.3
DEKALB	DKC67-44	66	17.2	8.4	3.7	Low	Medium	Med-High	Medium	Medium	59.9	15.8	32.0	92.1
DEKALB	DKC70-27	67	18.5	8.2	3.8	Medium	High	Medium	Medium	Med-High	59.3	17.3	28.6	90.1
Dyna-Gro	D55VC80	66	17.7	8.2	3.9	Medium	High	Low	Med-High	Med-High	58.1	15.9	29.6	93.4
Dyna-Gro	D58VC65	66	16.8	7.6	3.3	High	Med-Low	High	Med-Low	Med-Low	60.1	15.7	31.8	94.9
Great Heart	HT-7425	66	17.2	8.0	3.7	High	Med-Low	Med-High	Med-Low	Med-Low	58.8	15.6	34.3	87.6
Local Seed	LC1898	66	16.6	8.1	3.8	Medium	Med-High	Medium	Med-High	Med-Low	60.2	16.5	30.1	94.9
Local Seed	LC1987	67	17.8	8.4	3.9	High	High	High	Med-Low	Medium	59.9	15.4	32.6	96.9
Mission	A1548DG	66	17.3	8.0	3.7	High	Medium	Med-High	Med-Low	Medium	58.5	15.5	33.2	86.3
Pioneer	P1077	65	16.0	8.0	3.4	Medium	Low	High	Low	Medium	58.6	14.4	41.9	78.3
Pioneer	P1870	68	18.5	8.3	3.6	Med-High	Med-Low	High	Medium	Medium	59.3	16.6	40.2	80.8
Progeny	PGY 2015	66	16.3	8.0	3.9	High	Med-Low	Low	Med-High	Medium	59.7	15.3	37.2	92.9
		66	17.3	8.1	3.7						59.2	15.8	33.9	90.2



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2020 Grain Yield Summary (bu/a)

Dryland Locations

Brand	Hybrid	Canton	Natchez	West Point	Greenwood	Artesia Low Pop	Artesia High Pop	Ponto- toc Exp Sta	Mari- anna	Bolton	MSU	Ponto- toc	Shell- mound	NMREC	Average Yield*
AgriGold	A6544	220	199	185	164	189	206	158	176	190	187	201	130	140	180 BCD
AgriGold	A6572	209	168	193	155	185	197	188	175	159	202	203	99	161	176 D
AgriGold	A6659	209	199	191	167	179	193	158	182	171	176	203	136	163	179 BCD
DEKALB	DKC65-99	212	206	198	171	190	207	174	195	189	187	213	140	157	188 AB
DEKALB	DKC67-44	216	144	204	169	200	215	179	202	186	190	215	139	154	186 ABC
DEKALB	DKC68-69	222	199	189	185	204	218	170	207	188	189	221	136	152	191 A
Dyna-Gro	D58VC65	218	192	186	167	199	200	172	183	193	190	217	85	144	180 BCD
Great Heart	HT-7462	204	147	184	145	180	191	162	163	176	188	190	116	130	167 E
Local Seed	LC1577	227	190	190	158	198	203	161	166	174	205	218	83	146	178 CD
Local Seed	LC1898	208	187	191	160	192	203	169	185	186	197	193	136	151	181 BCD
Mission	A1548DG	202	174	184	149	176	196	163	193	172	187	204	134	138	175 DE
Pioneer	P1464	197	148	175	150	188	192	168	187	183	207	212	109	138	173 DE
Progeny	PGY 8116	192	185	179	150	186	197	162	185	168	188	188	129	146	173 DE
Progeny	PGY 9114	226	181	190	148	204	218	132	190	169	200	211	136	138	180 BCD
Location Average		211	180	189	160	191	203	165	185	179	192	206	122	147	179
Soil Type	Grenada silt loam	Convent silt loam	Griffith silty clay	Adler silt loam	Vaiden silty clay	Vaiden silty clay	Providence silt loam	Ochlocknee sandy loam	Loring silt loam	Leeper silty clay loam	Marietta loam	Dubbs loam	Leeper silty clay loam		
Planting Date	3-Apr	18-Mar	2-May	6-May	6-May	6-May	27-Apr	4-May	11-Apr	6-Apr	4-May	5-May	4-May		

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AgriGold	A6572	68	15.5	8.8	4.2	High	Med-High	Medium	Med-Low	High	60.4	15.6	36.3	87.1
AgriGold	A6659	67	16.1	8.7	4.0	High	Med-High	Very Low	Med-High	Medium	59.0	14.1	36.3	87.8
DEKALB	DKC65-99	66	15.7	8.4	3.9	Med-High	Medium	Low	High	Med-Low	59.3	16.5	36.6	86.2
DEKALB	DKC67-44	66	16.2	9.1	4.2	Low	Medium	Low	Med-High	Med-High	59.5	16.1	36.8	85.8
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