

PERFORMANCE OF COMMERCIAL CORN HYBRIDS IN ILLINOIS, 2019

TEST PROGRAM

Selection of entries. Each year, producers of corn hybrids in Illinois and surrounding states are invited to enter hybrids in the Illinois performance trials. Financing is provided thru entry fees. Entrants are required to enter their corn hybrids regionally at a fee of \$270 for each corn hybrid entered in a region or \$90 per hybrid for the corn following corn tests. Most of these hybrids are commercially available, although a few experimental hybrids are also entered.

Number and location of tests. In 2019, hybrid corn entrants were required to enter hybrid(s) in at least one of 4 regions each consisting of 3 locations with a total of 12 locations in the state (see map). These sites represent the major soil and climatic areas of the state.

Hybrids. There were 189 corn hybrids from 21 companies tested in 2019.

Field-plot design. Three replications of an alpha lattice design or randomized complete block were used to give each corn hybrid an equal chance to show its merits.

Planting methods. All trials were planted by a modern four row planter modified for small plot work. A soil insecticide (Force) was applied in furrow at planting for all corn trials. Corn plots were planted to stand and later counted to confirm population. Each plot was four rows wide and 23 feet long. The center two rows of each plot were harvested to determine yields.

Fertilization. All test fields were at a high level of fertility. Additional fertilizer was plowed down or side dressed as needed to ensure top yields.

Method of harvest. All corn plots were harvested with a custom-built, self-propelled, corn plot combine. Grain collected from each plot was weighed, and tested for moisture content. An electronic moisture monitor was used in the combine for all moisture readings. No allowance was made for grain that might have been lost in harvest.

PERFORMANCE DATA

Grain yield. Grain weight and moisture was converted to bushels per acre of No. 2 shelled corn (15.5 percent moisture).

Moisture content. Occasionally, hybrids too late in maturity for a given area are entered in these tests. These hybrids are often high in yield, but their moisture content may make them poor choices for farm use unless proper drying or storage facilities are available.

Erect plants. The number of erect plants in each plot of a hybrid was determined at harvest time. Any plant leaning at an angle of more than 45 degrees or broken below the ear was considered lodged. Plants broken above the ear were considered erect.

Population. Corn plots were planted to population and later counted to confirm population. Stand differences may be caused by failure to germinate or by damage from diseases, insects, cultivation, or rodents.

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SUGGESTIONS FOR COMPARING HYBRIDS

It is impossible to measure performance exactly in any test of plant material. Harvesting efficiency may vary, soils may not be uniform, and many other conditions may produce variability. Results of repeated tests, like those reported here, are more reliable than those of a single-year or a single-strip test. When one hybrid consistently out yields another at several test locations and over several years of testing, the chances are good that this difference is real and should be a consideration in choosing a hybrid. When comparing yields, however, grain moisture content, percentage of erect plants, and plant population must also be considered.

A number of statistical tests are available for comparing hybrids within a single trial. One of these tests, the least significant difference (L.S.D.), when used in the manner suggested by Carmer and Swanson¹ is quite simple to apply and is more appropriate than most other tests. When two hybrids are compared and the difference between them is greater than the tabulated L.S.D. value, the hybrids are judged "significantly different."

The L.S.D. is a number expressed in bushels per acre and presented following the average yield for each location. An L.S.D. level of 25% is shown. Find the highest yielding hybrid within the regional table or single location table of interest, subtract the 25% L.S.D. value from the highest yielding hybrid, every hybrid with a greater yield than the resulting number is 'statistically the same' as the highest yielding hybrid. Consider the merits of the hybrids in this group when making hybrid selections.

In a study of the frequencies of occurrence of three types of statistical errors and their relative seriousness, Carmer² found strong arguments for an optimal significance level in the range $\alpha = 0.20$ to 0.40 , where α is the Type I statistical error rate for comparisons between means that are really equal. Herein, a value of $\alpha = 0.25$ is used in computing the L.S.D. 25- percent level shown in the tables.

To make the best use of the information presented in this circular and to avoid any misunderstanding or misrepresentation of it, the reader should consider an additional caution about comparing hybrids. Readers who compare hybrids in different trials should be extremely careful, because no statistical tests are presented for that purpose. Readers should note that the difference between a single hybrid's performance at one location and its performance at another is caused primarily by environmental effects and random variability. Furthermore, the difference between the performance of hybrid A in one trial and that of hybrid B in another is the result not only of environmental effects and random variability, but of genetic effects as well.

¹Carmer, S.G. and M.R. Swanson. "An Evaluation of Ten Pairwise Multiple Comparison Procedures by Monte Carlo Methods." Journal of American Statistical Association 68:66-74. 1973.

²Carmer, S.G. "Optimal Significance Levels for Application of the Least Significant Difference in Crop Performance Trials." Crop Science 16:95-99, 1976.

2019 TEST FIELDS

Mt. Morris

Location: Nelson farm, Ogle county, north of Mt. Morris, north central Illinois.
Cooperator: Rick Nelson.
Soil type: Muscatine silt loam.
Planting date: April 24th.
Harvest date: November 9th.
Nitrogen: 182 lbs. N as PPI UAN.
Herbicides: PRE- Bicep II Magnum; POST- Impact.
Tillage: Spring- field cultivation.

DeKalb

Location: Drendel farm, DeKalb County, southwest of DeKalb.
Cooperators: Steve Drendel.
Soil type: El Paso silty clay loam.
Planting date: April 24th.
Harvest date: November 9th.
Nitrogen: (Conv) 160 lbs. as PPI UAN; (CFC) 200 lbs., 100 lbs. fall NH3 as 100lbs as PPI UAN.
Herbicides: PRE- Resicore and Atrazine; POST- Impact.
Tillage: Spring- field cultivator.

Fenton

Location: Mickley farm, Whiteside county, west of Rock Falls, northwestern Illinois.
Soil Type: Coffeen silt loam.
Cooperator: Ron and Dave Mickley.
Planting Date: April 23rd
Harvest Date: Not Harvested.
Nitrogen: 180 lbs., 160 lbs. as spring NH3, 20lbs. as PPI UAN.
Herbicides: PPI- Degree Xtra; POST- Impact.
Tillage: Fall- Chisel; Spring- field cultivate.

Monmouth

Location: University of Illinois, Northwestern Illinois Agricultural Research and Demonstration Center, Warren County, northwest of Monmouth.
Cooperators: Greg Steckel; research director, Martin Johnson; farm foreman.
Soil type: Sable silty clay loam.
Planting date: April 25th.
Harvest date: October 12th.
Nitrogen: (conv) 170lbs;
(CFC) 210lbs. as PPI 28%.
Herbicides: PRE- Harness Xtra. Post- Calisto, Atrazine.
Tillage: Fall- disk ripper; spring- field cultivate.

New Berlin

Location: Bennett Farm, Sangamon county, north of New Berlin, central Illinois.
Cooperators: Leahy Bennett.
Soil type: Sable silt loam.
Planting date: April 23rd.
Harvest date: October 5th.
Nitrogen: 175 lbs. 45 lbs. 28% PRE
, 130 lbs. as 32% sidedress.
Herbicides: PPI- Parallel Plus; POST- Impact.
Fungicide: Headline AMP (VT).
Insecticide: Lambda (VT).
Tillage: Fall- V rip; Spring- vertical finisher.

Quincy

Location: University of Illinois, Orr Agricultural Research and Demonstration Center, Pike County, west of Perry, west-central Illinois.
Cooperator: Wes Chappell.
Soil type: Clarksdale silt loam.
Planting date: June 4th.
Harvest date: October 23rd.
Nitrogen: 220 lbs., 180 lbs. as 28% PPI, 30 lbs. as fall DAP.
Herbicides: POST- Impact.
Tillage: Fall- Chisel, Spring- field cultivate.

Dwight

Location: Hoffman farm, Grundy county, north of Dwight, northeastern Illinois.
Cooperator: Allen Hoffman.
Soil type: Reddick silty clay loam.
Planting date: June 4th.
Harvest date: Not harvested.
Nitrogen: 200 lbs. as UAN Side dress.
Herbicides: PPI- Salvo, Atrazine;
POST- Impact.
Tillage: Fall strip till.

Goodfield

Location: Wurmnest farm, Woodford county, north of Goodfield, central Illinois.
Cooperator: Mike Wurmnest.
Soil Type: Ipava silt loam.
Planting date: April 26th.
Harvest date: October 20th.
Nitrogen: 200 lbs., 140 lbs. as PPI UAN, 60 lbs. as fall DAP.
Herbicide: Pre- Lexar; POST- Impact.
Tillage: Fall- chisel, Spring- field cultivator.

Urbana

Location: University of Illinois, Crop Sciences Research and Education Center, Champaign county, Urbana, east-central Illinois.
Cooperators: Nick Eisenmenger, farm foreman.
Soil type: Flanagan silt loam.
Planting date: (conv) May 16th (CFC) June 3rd.
Harvest date: (conv) October 6th.
(CFC) October 24th.
Nitrogen: (Conv) 210 lbs. as 28% PPI.
(CFC) 210 lbs. as 28% PPI.
Herbicides: PPI- Resicore;
POST-Impact.
Tillage: Spring- soil finisher, Fall- chisel plow.

St. Peter

Location: Schwarm Farm, Fayette county, North of St. Peter, south-central Illinois.
Cooperators: Russ Schwarm, Scott Reynolds.
Soil type: Hoyleton silt loam.
Planting date: June 2nd.
Harvest date: October 22nd.
Nitrogen: 230 lbs. N as 28%, 150 lbs. as PPI, 80 lbs. as side dress.
Herbicides: PPE- Verdict, Roundup; POST- Impact.
Tillage: Fall- Disk; spring- Field cultivate.

Belleville

Location: Tiedemann Farm, east of Belleville, St. Clair county.
Cooperators: David and Dan Tiedemann.
Soil type: Caseyville silt loam.
Planting date: June 1st.
Harvest date: October 22nd.
Nitrogen: 180 lbs. as spring NH3.
Herbicides: PPI- Medal II ATZ and Sotriion.
Fungicide: Trivapro at VT.
Tillage: Spring- field cultivator.

Elkville

Location: Funk farm, Jackson county, Elkville, north of Carbondale, southern Illinois.
Cooperators: John and Trent Funk.
Soil Type: Okaw silt loam.
Planting date: June 1st.
Harvest date: October 7th.
Nitrogen: 185 lbs. as Anhydrous (spring).
Herbicides: PPI- Lumax; POST- Impact.
Tillage: Fall- Chisel, Spring- field cultivator.

2019 CORN LOCATIONS

GROWING SEASON RAINFALL

Location	April	May	Jun	July	Aug	Sept	Total
Mt. Morris	3.15	7.12	4.08	1.53	3.57	9.86	32.03
DeKalb	3.63	7.07	2.98	1.91	4.17	10.4	33.35
Fenton	4.65	8.62	3.75	2.30	3.72	6.95	33.68
Monmouth	2.59	9.54	3.56	0.5	3.84	7.44	30.83
New Berlin	3.88	4.65	7.42	2.35	5.05	3.85	31.79
Perry	2.42	5.85	5.54	3.30	4.17	3.82	26.97
Dwight	3.46	8.26	5.37	4.25	1.17	8.15	34.67
Goodfield	3.38	6.98	4.78	1.55	3.43	7.79	31.59
Urbana	4.54	4.99	3.35	3.82	2.07	2.88	23.61
St. Peter	4.68	5.86	7.31	2.31	7.34	0.92	29.69
Belleville	5.54	6.81	5.32	5.82	7.89	1.10	35.02
Elkville	6.68	5.22	6.80	1.74	1.80	0.58	24.16



SOURCES OF SEED

AgVenture , Wehmeyer Seed,	www.agventure.com
Axis , Axis Seed Direct,	www.axisseed.com
B&A Genetics , B&A Genetics,	www.bagenetics.us
Burrus , Burrus Seed,	www.burrusseed.com
Channel , Channel,	www.channel.com
Cornelius , Cornelius, Seed,	www.corneliusseed.com
Dairyland , Dairyland Seed,	www.dairylandseed.com
DeKalb , Dekalb,	www.asgrowanddekalb.com
FS InVISION , FS InVISION	www.fsinvision.com
LG , LG Seeds,	www.lgseeds.com
Miller , Miller Hybrids,	www.millerhybrids.com
NuTech , NuTech Seed, LLC	www.nutechseed.com
Pioneer , Pioneer Hybrids,	www.pioneer.com
Power Plus , Burrus Seeds,	www.burrusseed.com
Prairie , Prairie Hybrids,	www.prairiehybrids.com
Renk , Renk Seed Co.	www.renkseed.com
Roeschley , Roeschley Hybrids,	www.roeschleyhybrids.com
Stone , Stone Seed Group,	www.stoneseed.com
Sun Prairie Seeds , Sun Prairie Seeds,	www.sunprairiehybrids.com
Viking , Albert Lea Seed,	www.alseed.com
Whisnand , Whisnand Hybrids,	(217-268-3714)
Wyffels Hybrids , Wyffels Hybrids,	www.wyffels.com

KEY TO REGIONS

- 1 (North) = Mt. Morris, DeKalb, Fenton
- 2 (W. Central) = Monmouth, Perry, New Berlin
- 3 (E. Central) = Dwight, Goodfield, Urbana
- 4 (South) = St. Peter, Belleville, Elkville
- 5 DeKalb Corn Following Corn
- 6 Monmouth Corn Following Corn
- 7 Urbana Corn Following Corn

** RM = Relative Maturity in Days