

PERFORMANCE OF COMMERCIAL CORN HYBRIDS IN ILLINOIS, 2021

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 \$280 for each corn hybrid entered in a region or \$94 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 2021, 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 194 corn hybrids from 20 companies tested in 2021.

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.

Lodging. A rating from 0 (no plants lodged) to 9 (all plants lodged). The number of lodged 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. Stand differences may be caused by failure to germinate or by damage from diseases, insects, cultivation, or rodents.

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.

SOURCES OF SEED

AgVenture, Wehmeyer Seed
www.agventure.com

Axis, Axis Seed Direct
www.axisseed.com

Beck's, Beck's Superior Hybrids
www.beckshybrids.com

Burrus, Burrus Seed
www.burrusseed.com

Cappel, Cappel Certified Seeds
www.cappelleseeds.com

Channel, Channel
www.channel.com

Cornelius, Cornelius Seed
www.corneliusseed.com

Dairyland, Dairyland Seed
www.dairylandseed.com

DeKalb, Bayer Crop Sciences
www.asgrowanddekalb.com

Hi Fidelity, Hi Fidelity Genetics
www.hifidelitygenetics.com

NuTech Seed, NuTech Seed, LLC
www.nutechseed.com

Pioneer, Corteva
www.pioneer.com

Power Plus, Burrus Seeds
www.burrusseed.com

Prairie, Prairie Hybrids
www.prairiehybrids.com

Renk, Renk Seed Co.
www.renkseed.com

Stone Seed, 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, Wyffels Hybrids
www.wyffels.com

2021 CORN LOCATIONS



