

Performance of Commercial Soybeans in Illinois

THE UNIVERSITY OF ILLINOIS commercial soybean testing program was started in 1969 as a result of requests by seedsmen that their private varieties be tested. The 2021 trials consisted of 247 varieties from 27 companies with the following herbicide trait packages:

- 50- none (conventional)
- 3- conventional and STS
- 9- glufosinate
- 98- 2,4-D, glufosinate and glyphosate
- 5- 2,4-D, glufosinate, glyphosate and STS
- 1- glyphosate
- 65- dicamba, glufosinate and glyphosate
- 5- dicamba, glufosinate, glyphosate and STS
- 10- dicamba and glyphosate
- 1- dicamba, glyphosate and STS

The purpose of this commercial soybean testing program is to provide unbiased, objective, and accurate testing of all varieties entered. The tests are conducted on as uniform a soil as is available in the testing area. Small plots are used to reduce the chance of soil and climatic variations occurring between one variety plot and another.

The results of these tests should help you judge the merits of varieties in comparison with other private and public varieties. Because your soils and management may differ from those of the test location, you may wish to plant variety strips of the higher-performing varieties on your farm. The results printed in this circular should help you decide which varieties to try.

TEST PROGRAM

Selection of entries. Seed companies in Illinois and surrounding states were invited to enter soybean varieties, brands, or blends in the 2021 Illinois soybean performance trials. Entrants were required to enter all non-irrigated, 30-inch-row-width trials on a regional basis. To finance the testing program, a fee of \$93 per location was charged for each variety entered by the seed company. Most of these varieties, brands, or blends are commercially available, but some experimental varieties were also entered.

Number and location of tests. In 2021, tests were conducted at 13 locations in the state. These sites represent the major soil and maturity zones of the state.

Non-irrigated, 30-inch-row-width trials were conducted on a regional basis. The regions are as follows:

- Region 1. Fenton, Freeport and DeKalb
- Region 2. Monmouth, Goodfield & Dwight
- Region 3. Perry, New Berlin & Urbana
- Region 4. St. Peter and Belleville
- Region 5. Elkhart and Harrisburg

Field plot design. Entries of each test were replicated three times in a randomized complete block or alpha lattice design. The 30-inch-row trial plots consisted of four rows, each 21 feet long. The center two rows of each plot were harvested to measure yield.

Fertility and weed control. All test locations were at a high level of fertility. Herbicides were used when necessary for weed control. Weed control for all locations consisted of a pre-emergence foundation herbicide followed by conventional post-emergence herbicide application. Plots were also weeded by hand if needed.

Method of planting and harvesting. Plots were planted in 30-inch-row spacing using a modified bean planter at 166,000 ppa. Harvesting was done with a small-plot combine. No allowances were made for soybeans that may have been lost as a result of combining or shattering.

PERFORMANCE DATA

Yield. Soybean yield was measured in bushels (60 pounds) per acre at a moisture content of 13 percent. An electronic moisture monitor was used on the combine for all moisture readings.

Maturity. Maturity was stated as the date when approximately 95 percent of the pods were ripe.

Lodging. The amount of lodging was rated at harvest time. The following scale was used:

- 0- No Plants leaning or lodged
- 9 - Almost all plants leaning or down

Height. Height was measured at harvest as the average length of plants from the ground to the tip of the main stem.

Shattering. The percentage of open pods was estimated at harvest time. The following scale was used:

- 0 - No shattering
- 9 - 100% of pods open

Shattering was not significant at any location.

SUGGESTIONS FOR COMPARING ENTRIES

It is impossible to obtain an exact measure of performance when conducting 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 are more reliable than those of a single year or a single strip test. When one variety 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 considered in selecting a variety.

However, yield is not the only indicator. You should also consider maturity, lodging and plant height.

As an aid in comparing soybean varieties, brands, and blends within a single trial, certain statistical tests have been devised. 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 varieties are compared and the difference between them is greater than the tabulated L.S.D. value, the varieties are judged to be "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 soybean variety within the regional table or single location table of interest, subtract the 25% L.S.D. value from the highest yielding variety, every variety with a greater yield than the resulting number is 'statistically the same' as the highest yielding variety. Consider the merits of the varieties in this group when making varietal 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 varieties. Readers who compare varieties in different trials or row spacings should be extremely careful, because no statistical tests are presented for that purpose. Readers should note that the difference between a single varieties performance at one location or row spacing and its performance at another is caused primarily by environmental effects and random variability. Furthermore, the difference between the performance of variety A in one trial or row spacing and the performance of variety B in another trial or row spacing 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.

2021 Soybean Location



SOURCES OF SEED

Agventure , Wehmeyer Seed	www.agventure.com
Asgrow , Bayer Crop Science	www.aganytime.com
Baird Seed , Baird Seed	www.bairdseed.com
Beck's , Beck's Hybrids	www.beckshybrids.com
Burrus , Burrus Seed	www.burrusseed.com
Channel , Channel Seed	www.channel.com
Cornelius , Cornelius Seed	www.corneliusseed.com
Dairyland , Dairyland Seed	www.dairylandseed.com
DeRaedt , DeRaedt Seed Corp.	847-514-8844
DONMARIO , GDM Seeds	www.gdmseeds.com
Dyna-Gro , Nutrien Ag Solutions	www.dynagroseed.com
Genesis, Renk Seed	www.renkseed.com
Golden Harvest , Golden Harvest	www.goldenharvestseeds.com
Hoffman , Hoffman Seed Inc.	www.hoffmanseed.com
Lakeview Farms , Lakeview Farms	573-590-2222
Martin , Martin Seeds	765-986-2030
Missouri , University of Missouri	573-379-5431
Monier , Monier Seed & Service	www.monierseed.com
NuTech Seed , NuTech Seed LLC	www.nutechseed.com
P3 , Cornelius Seed	www.corneliusseed.com
Pioneer , Corteva	www.pioneer.com
Public , Univ. Of Illinois	https://cropsciences.illinois.edu
Renk , Renk Seed	www.renkseed.com
Stone , Stone Seed Group	www.stoneseed.com
Sun Prairie , Champaign Co. Seed	www.sunprairieseeds.com
Viking Seed , Albert Lea Seed House	www.alseed.com
Xitavo , BASF	www.BASF.com

