

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 2019 trial was made up of 236 varieties consisting of 6 liberty only resistant, 20 roundup and liberty resistant 35 conventional 36 enlist and 134 roundup, dicamba resistant varieties from 26 seed companies.

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 2019 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 \$90 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 2019, 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 conventional, liberty resistant and roundup resistant, were conducted on a regional basis. The regions are as follows:

- Region 1. Fenton, Mt. Morris and DeKalb
- Region 2. Monmouth, Goodfield & Dwight
- Region 3. Quincy, New Berlin and Urbana
- Region 4. St. Peter and Belleville
- Region 5. Elkhville 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 trial specific post-emergence application of Roundup, Liberty or conventional 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:

- 1 - Almost all plants erect
- 2 - All plants leaning slightly or a few plants down
- 3 - All plants leaning moderately (45°), or 25 to 50 percent of the plants down
- 4 - All plants leaning considerably, or 50 to 80 percent of the plants down
- 5 - Almost all plants 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:

- 1 - No shattering
- 2 - 1 to 10% of pods open
- 3 - 10 to 25% of pods open
- 4 - 25 to 50% of pods open
- 5 - Over 50% 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.

2019 SOYBEAN LOCATIONS



2019 TEST FIELDS

Fenton

Location: Mickley Farm, Whiteside County, west of Rock Falls, northwestern Illinois.

Cooperators: Ron and Dave Mickley.

Soil Type: Coffeen silt loam

Planting Date: June 8th.

Harvest Date: October 15th.

Herbicide: Pre- Authority First, Zidua.

Post- First Rate, Select Maxx; Zidua

Tillage: fall—Disc/ripper, spring—field cultivate.

Mt. Morris

Location: Nelson Farm, Ogle County, North of Mt. Morris, north central Illinois.

Cooperator: Rick Nelson.

Soil type: Muscatine silt loam.

Planting Date: June 8th.

Harvest Date: November 8st.

Herbicide: Pre-Authority First, Zidua.

Post-First Rate, Zidua, Select Maxx.

Tillage: fall- vertical till, spring- field cultivate.

DeKalb

Location: Drendel Farm, DeKalb County, southwest of DeKalb.

Cooperator: Steve Drendel

Soil type: Flanagan silty clay loam.

Planting Date: June 8th.

Harvest Date: October 15th.

Herbicide: Pre-Authority First, Zidua.

Post-First Rate, Zidua, Select Maxx.

Tillage: fall-chisel, spring- soil finished.

Monmouth

Location: University of Illinois, Northwestern Illinois Agricultural Research and Demonstration Center, Warren County, northwest of Monmouth.

Cooperators: Greg Steckel, agronomist; Martin Johnson, farm foreman.

Soil type: Sable silty clay loam.

Planting Date: June 4th.

Harvest Date: November 6th.

Herbicide: Pre-Authority First, Dual II Mag;

Post-First Rate, Zidua, Select Maxx

Tillage: fall-disk-ripper, spring- field cultivate.

Goodfield

Location: Wurmnest Farm, Woodford County, north of Goodfield, central Illinois.

Cooperator: Mike Wurmnest.

Soil Type: Ipava silt loam.

Planting Date: May 17th.

Harvest Date: October 19th.

Herbicide: Pre-Authority First, Zidua.

Post-First Rate, Zidua, Select Maxx, Phoenix.

Tillage: fall- Chisel, spring- field cultivate.

Dwight

Location: Grundy County, Hoffman Farm.

Cooperator: Allen Hoffman.

Soil type: Reddick silty clay loam.

Planting Date: June 11th.

Harvest Date: November 7th.

Herbicide: Pre-Authority First, Zidua.

Post-First Rate, Zidua, Select Maxx, Phoenix.

Tillage: fall-chisel, spring- field cultivate.

Quincy

Location: Dedert Farm, Adams county, west central Illinois.
 Cooperator: David Dedert.
 Soil type: Edwardsville silt loam.
 Planting Date: June 5th.
 Harvest Date: November 5th.
 Herbicide: Pre-Authority First, Zidua.
 Post-First Rate, Zidua, Select Maxx.
 Tillage: spring- field cultivator.

New Berlin

Location: Bennett Farm, Sangamon County north of New Berlin, Central Illinois.
 Cooperator: Leahy Bennett.
 Soil type: Sable silty clay loam.
 Planting Date: May 17th.
 Harvest Date: October 14th.
 Herbicide: Pre-Authority First, Zidua
 Post-First Rate, Zidua, Phoenix, Select Maxx
 Fungicide: Headline AMP (8/1).
 Tillage: fall-V ripper, spring-vertical finisher.

Urbana

Location: University of Illinois, Crop Sciences Research & Education Center, Champaign County, east central Illinois.
 Cooperator: Jeff Warren, farm foreman.
 Soil type: Flanagan silt loam.
 Planting Date: May 17th.
 Harvest Date: October 11th.
 Herbicide: Pre-Authority First, Zidua,
 Post-First Rate, Zidua, Phoenix, Select Maxx
 Tillage: fall-chisel, spring-soil finisher.

St. Peter

Location: Schwarm Farm, Fayette County, North of St. Peter, south central Illinois.
 Cooperator: Russ Schwarm, Scott Reynolds.
 Soil type: Darmstadt silt loam.
 Planting Date: June 2nd.
 Harvest Date: Not harvested.
 Herbicide: Pre-Authority MTZ, Prowl H2O;
 Post- None.
 Tillage: fall- chisel plow, 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 13th.
 Harvest date: November 4th.
 Herbicides: Pre-Authority First, Zidua,
 Post- None.
 Tillage: Spring- field cultivator.

Elkville

Location: Funk farm, North of Carbondale, Jackson County, extreme southern Illinois.
 Cooperator: Trent Funk.
 Soil type: Okaw silt loam.
 Planted: June 2nd.
 Harvest: October 9th.
 Herbicide: Pre-Authority First, Zidua,
 Post-First Rate, Zidua, Phoenix, Select Maxx
 Tillage: fall-chisel, spring-soil finisher.
 Tillage: fall-V ripper, spring-vertical finisher.

Harrisburg

Location: Wintizer farm, Saline County, extreme southern Illinois.
 Cooperator: Kevin Wintizer.
 Soil type: Darwin silt loam.
 Planted: May 25th.
 Harvest: October 9th.
 Herbicide: Pre- Authority First, Zidua.
 Post-First Rate, Zidua, Select Maxx.
 Tillage: fall-disk, spring-disk, field cultivate.

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
Quincy	2.79	10.1	7.81	2.52	5.27	5.41	37.21
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
Harrisburg	5.59	5.40	6.68	2.69	3.80	0.27	25.67

SOURCES OF SEED

AGS , Stratton Seed	www.strattonseed.com
Agventure , Wehmeyer Seed	www.agventure.com
Asgrow , Bayer Crop Science	www.aganytime.com
BioGene , Miller Bros Fert.	217-456-8261
Baker , Baker Seed LLC.	www.bakerseed.com
Channel , Channel Seed	www.channelseed.com
Cornelius , Cornelius	www.corneliusseed.com
Credenz , BASF	www.BASF.com
DeRaedt , DeRaedt Seed	847-514-8844
DONMARIO , GDM Seeds	www.gdmseeds.com
Dyna-Gro , Dyna-Gro Seed	www.dynagroseed.com
FS Hisoy , Growmark	www.fsseeds.com
Genesis , Renk Seed	www.renkseed.com
GO Soy , Stratton Seed	www.strattonseed.com
Green Valley , Green Valley Seed	www.gvseed.com
Hoffman , Hoffman Seed	www.hoffmanseedhouse.com
Illini , Baird Seed Co.	www.bairdseedcompany.com
LG Seeds , LG Seeds	www.lgseeds.com
Monier , Monier Seed	309-238-1227
P3 , Cornelius Seed	www.corneliusseed.com
Power Plus , Burrus Seeds	www.burrusseed.com
Public , Univ. Of Illinois	217-265-4062
Renk , Renk Seed	www.renkseed.com
Stone , Stone Seed Group	www.stoneseed.com
Sun Prairie , Champaign Co. Seed	www.sunprairienseeds.com
Viking Seed , Albert Lea Seed	www.alseed.com