PERFORMANCE OF PUBLIC AND PRIVATE SOYBEANS IN INDIANA, 2000

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INTRODUCTION

Soybeans are evaluated annually at several locations in Indiana. These trials are conducted according to the policies and procedures of the Indiana Agricultural Research Programs at Purdue University. In this bulletin, results of the 2000 performance trials are given, as well as multiple year averages for those entries tested in the past three test years. Data for experimental entries are not included.

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Performance results for both private and public entries are presented. Certified seed was used for planting public varieties. Private entries, entered voluntarily by the owner, were accepted in the trial after meeting requirements for eligibility and payment of a testing fee. No verification has been made that the seed, or the quality of the seed, entered in this trial is the same as that offered for sale to the public.

Plans and rules for entering this trial are available, upon request, to anyone at any time. Persons wishing to enter the soybean performance trial should contact the author by February 1.

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PERFORMANCE TRIAL METHODOLOGY

Location of Trials

This section contains information on locations and procedures used in conducting the trials.

In 2000, trials were planted at five locations (see Figure 1). The locations, numbered from north to south are:

Location 1. Porter County at the Pinney-Purdue Agricultural Center near Wanatah, on Runneymede loam, a dark gray depressional soil underlain by sandy substrata.

Location 2. Tippecanoe County at the Purdue University Agronomy Research Center near Lafayette, on Drummer silty clay loam, a very dark gray or black, poorly drained depressional soil. Drummer was formerly classified as Chalmers.

Location 3. Randolph County at the Davis-Purdue Agricultural Center near Farmland, on Blount silty clay loam, a dark grayish-brown, somewhat poorly drained soil.
Location 4. Knox County at the Southwest-Purdue Agricultural Center near Vincennes, on Ade loamy fine sand, a very dark gray, gently sloping, somewhat excessively drained soil. Ade soil has low available water capacity and rapid permeability. Organic matter is relatively high and surface runoff is slow.

Location 5. Jennings County at the Southeast-Purdue Agricultural Center near Butlerville, on Avonburg silt loam, a light grayish, nearly level, somewhat poorly drained soil, with fragipan in the subsoil.

Methods Used in the Trials

In 2000, in all of the trials, the soybeans were grouped by maturity, and planted in the respective early or late maturity group at each location. High-germinating seed (usually 90 percent or better) was used in the trial. The soybean plots were planted in a randomized complete block design with four replications at each location. Anticipated maturity differences between adjacent plots were restricted to 10 days or less.

Planting Equipment Used in the Trials. Two different planters were used to establish the trials reported in this bulletin. Conventional tillage seedbeds, at all five locations, were planted using the Almaco grain drill. Conventional and Roundup Ready® soybeans, planted in no-till seedbeds, (location 5 only) were planted with the Great Plains No-Till Drill. (Roundup Ready® is a trademark of Monsanto Company.) The drills are described in the following paragraphs.

The Almaco Grain Drill was designed and custom built for research plot work. The drill is equipped with 10 John Deere openers set on 7.5 inch row spacing, and is equipped with spring-loaded press wheels. The drill dropped a pre-counted number of seeds in each 33 linear feet of row. The planting rate for proprietary entries, selected by the owner, varied from 2.6 to 5.0 live seeds per linear foot of row. Public entries were seeded at the rate of 3.0 live seeds per linear foot of row, which would be 209,088 live seeds per acre. Assuming 90 percent emergence, this should produce a stand of 188,179 plants per acre.

The Great Plains No-Till Drill is equipped with 11 openers set on 7.5-inch row spacing. The drill is equipped with a belt cone distributor, which dropped a pre-counted number of seeds equivalent to 200,000 seeds per acre. Unless otherwise stated, (for the no-till trials), germination was assumed to be 90 percent for all of the entries. The target population was 162,000 plants per acre assuming that 90 percent of the viable seed emerged. The no-till trials, at location 5, were conducted by Dr. E. P. Christmas and were planted with this Great Plains No-Till drill.

Statistically valid yield comparisons may be made within the trials using either of these planters. Practical comparisons may be made among the trials planted with the same equipment, if planted at the same time, at the same location. Comparisons made between trials conducted using these two different planters could lead to incorrect conclusions.

Conventional farm equipment was used for seedbed preparation. Conventional tillage seedbeds, prepared for conventional and Roundup Ready® soybeans, were clean-tilled prior to planting. All conventional soybeans, in conventional tillage seedbeds, were treated with pre-plant and post-emergence herbicides, and season long weed control was adequate. Hand-weeding was used to remove the few weeds that emerged late in the season. Conventional soybeans, planted in no-till seedbeds, had chemical burn-down applied prior to planting, and were sprayed with post-emergence herbicides. Season long weed control was adequate, and hand-weeding was used to remove the few weeds that emerged late in the season.
Seedbeds were clean tilled for all of the Roundup Ready® trials planted in conventional tillage seedbeds, and were sprayed once with Roundup Ultra® just prior to canopy closure. In the no-till seedbeds, chemical burn down was applied prior to planting, and the trials were sprayed again, with Roundup Ultra®, just before canopy closure. Season long weed control was adequate, and hand-weeding was used to remove the few weeds that emerged late in the season. Roundup Ultra® is a trademark of Monsanto Company.

The conventional seedbed trials, (planted using the Almaco Drill, with 10 rows on 7.5 inch spacing), were calculated as 75 inches wide. The solid-seeded trials, performed by Dr. E. P. Christmas using the Great Plains no-till drill, were 11 drill rows wide. Row spacing was 7.5-inches, and plot with was calculated as 82.5 inches wide. The no-till drill was used only at location 5.

Plots in all of the trials were end-trimmed prior to harvest, and all rows were harvested for yield. Observations such as plant height, lodging and maturity were taken from the center rows.

**Yield data.** All of the trials reported in this bulletin were harvested with an Almaco combine. The combine is equipped with a modified John Deere 900 series head with a floating cutter bar. Grain yields were weighed, and moisture tested automatically, on the combine, using a Seed Spector II and a Psion HC 110. The Seed Spector II equipment was calibrated using a Motomco moisture meter and Chantillon scales, and the calibrations were checked throughout the harvest season. It should be pointed out that this equipment is not the same as equipment used to meet official grain sampling standards, but is believed to be suitable for field plot work. All yields were adjusted to 13 percent moisture and are reported as bushels per acre.

**Plant height,** taken at maturity, is the average length (to the nearest inch) from the soil surface to the tip of the main stem.

**Lodging** is rated at maturity according to the following scores:

1 - Almost all plants erect.
2 - All plants leaning slightly or a few plants down.
3 - All plants leaning moderately (45 degrees) or 25-50 percent of plants down but still harvestable with conventional equipment.
4 - All plants leaning considerably or 50-80 percent of plants down and difficult to harvest with conventional equipment.
5 - Almost all of the plants down, and harvest losses would occur with conventional equipment.

**Maturity date** is when more than 90 percent of the pods are ripe (brown); and days (to maturity) are the number of days from planting to maturity. Delayed leaf drop and green stems are not considered when assigning maturity. About a week of good drying weather may be needed before soybeans are ready to harvest after reaching maturity. Soybeans should mature about two weeks before the average date of the first killing frost, which ranges from approximately October 10 in northern Indiana to October 25 in southern Indiana.

**Statewide Weather and Harvest Summary**

Information contained in this section is gleaned from weekly reports, "Indiana Crop & Weather Report", from the Indiana Agricultural Statistician at Purdue University.

The first crop report for the 2000 growing season, issued April 9, 2000, indicated half of Indiana soils were adequate to surplus, and half were short to very short in topsoil moisture. Sub-soil moisture was 30 percent adequate to surplus, and 70 percent was short to very short. Soil moisture improved during the month of April, and by the end of the month nearly three-fourths of the top-soil had adequate to surplus moisture. More than half of the sub-soil was still short to very short at the end of the month. Fieldwork progressed rapidly during April, and the April 16 crop report indicated a few soybeans were planted around the state. The April 30 report indicated 10 percent of the soybeans were planted. This compares to 4 percent for the long term average.

Soybeans made good progress during May. Each crop report stated that soybean planting was progressing well ahead of average. The May 28 crop report indicated soybean planting at 87 percent planted, on par with 1999 and well ahead of the 56 percent for average. Topsoil moisture, the end of May, was mostly adequate to surplus, and sub-soil moisture improved to 57 percent adequate to surplus.
The June 4 report indicated soybean planting to be 94 percent completed compared to 95 percent in 1999 and 65 percent for the 5-year average. Soybeans, at the beginning of June, were rated 67 percent good to excellent. By mid-June virtually all soybeans, except for the double-crop acreage, had been planted. Soybeans were rated 66 percent good to excellent. Soybean condition declined during June and by the July 2 report, only 63 percent were rated good to excellent. Moisture during June brought top-soil and sub-soil moisture ratings to mostly adequate to surplus.

Double-crop soybean planting was underway in southern Indiana by the last week of June, and was virtually finished by the middle of July. The soybean condition improved in July, with 71 percent rated good to excellent. Soybeans planted in April and May were 61 percent in bloom compared to 72 percent in 1999 and 34 percent for average. At the end of July, soil moisture was about two-thirds adequate to surplus. The soybean crop was rated 67 percent good to excellent compared to 43 percent in 1999, and 92 percent of the crop was blooming. Pod-setting was underway in 47 percent of the crop, compared to 24 percent for average.

By mid-August, about three-fourths of the soils were rated adequate to surplus in moisture. The favorable moisture rating remained over most of the state through the rest of the month. The soybean condition, at the end of August was rated 68 percent good to excellent compared to 31 percent in 1999. Pods were setting in 98 percent of the soybean acreage and 10 percent were shedding leaves.

The soybean condition rating declined again the first week of September to 66 percent good or better. In 1999 the crop was rated 25 percent good or better at the beginning of September. The 2000 crop was 5 percent mature compared to 4 percent for average. Soil moisture was adequate to surplus in 65 to 70 percent of the state. By mid-September, soybean harvesting was underway, with 3 percent of the crop harvested. This is about on par with average. Soil moisture, over most of the state, remained adequate to surplus.

The October 1 report stated that 21 percent of the crop was harvested, compared with 45 percent in 1999, and 27 percent for average. Soybean average moisture was reported to be 13.0 percent. The October 8 report stated that 90 percent of the crop was mature, compared to 96 percent in 1999, and 87 percent for average. The crop was 44 percent harvested compared to 48 percent for average. Soil moisture was rated 55 to 68 percent adequate and 2 to 12 percent short.

Soybean harvest progressed through October at a normal pace, and soil moisture continued adequate over most of the state.

The final crop and weather report for 2000, issued November 5, 2000 reported that, as of November 5, 97 percent of the soybean crop was harvested, compared with 96 percent for average. Soybean moisture content was averaging about 11 percent.

In summary, the 2000 growing season, for soybeans, had an excellent start, and made good progress during most of the growing season. Many producers reported yields to be above their expectations.

On November 6, 2000, the Indiana Agricultural Report presented the following information concerning soybean production in Indiana in 2000.

"Continuing the downward trend of recent years, public soybean varieties accounted for only 1.1 percent of the total 5.7 million acres planted in 2000. Private varieties totaled 91.9 percent of Indiana's soybean acreage in 2000 (unchanged from 1999). Leading the way again this year was Pioneer with 25.1 percent. Second place went to Asgrow with 15.3 percent, and Becks came in third place with 11.3 percent of the total soybean acreage. DeKalb ranked fourth with 6.8 percent. Unidentified varieties accounted for 7.0 percent of the acreage in 2000."

"Indiana farmers practiced conventional tillage on 15.5 percent of the planted acreage and minimum tillage on 16.0 percent of the planted acres, the remaining 68.5 percent were planted with no-till."

On November 20, 2000 the Indiana Crop and Livestock Reporting Service reported:

"Based on conditions November 1, 2000 .... Indiana soybean production is forecast at 260.4 million bushels, unchanged from
the October forecast, and 20 percent above last year’s production of 216.5 million bushels. The expected yield of 46 bushels per acre is unchanged from last month’s forecast and 7 bushels above last year’s yield of 39 bushels per acre. The 5.66 million acres for harvest, is 2 percent above last year’s level, but unchanged from October.”

"Nationally, ……….. soybean production is forecast at a record high 2.78 billion bushels, down 2 percent from October 1, but 5 percent above 1999. The yield forecast at 38.0 bushels per acre, decreased 0.7 bushels from last month, but is 1.4 bushels above the 1999 final yield. Acreage for harvest is estimated at a record 73.0 million acres, unchanged from October 1, but up 1 percent from 1999. Yield decreases in the western Corn Belt and Great Plains regions more than offset yield increases in the mid-Atlantic states and Ohio. Reduced yields in the Corn Belt were a result of lower pod counts.”

**DISCUSSION**

It is not possible to absolutely determine or predict the response of plants to the environment. The results of every field trial conducted are influenced by the treatment and by the experimental error. In these trials, the treatment is the soybean entry (variety, brand, or blend) planted in the trial. Experimental error is a composite term to indicate everything that could not be controlled by the person performing the trial. It is not intended to include human error. These trials are conducted on the assumption that all the entries in the trial are equal until evidence is obtained that they are not equal. In order to obtain this evidence it is necessary to determine whether the trial results were influenced most by the entries or by experimental error. To do this an analysis of variance is performed and the relationship of the yielding ability of the entries to experimental error is determined. The analysis of soybean performance trials show that maturity relationships are very predictable whereas yield relationships are the most difficult to predict.

Probability levels have been established to assess the validity of the trial. Generally trials should be significant at the 10 percent probability level. This means 1 trial in 10 could be a fluke and not be detected. In this bulletin, 16 of the year-2000 trials are significant at the 10 percent probability level, and 7 trials are not. The year-2000 trials, which are not significant, at the 10 percent probability level are:

- Table 4, Roundup Ready® maturity group II.
- Table 9, Roundup Ready® maturity group II.
- Table 13, Roundup Ready® maturity group II.
- Table 18, Roundup Ready® maturity group IV.
- Table 24, Conventional Soybeans, maturity group IV in no-till.
- Table 26, Roundup Ready® maturity group III, in conventional tillage.
- Table 28, Roundup Ready® maturity group IV, in no-till.

The analysis of variance makes it possible to compute a coefficient of variability (C.V.). The coefficient of variability is a relative term. It is the ratio of the standard deviation to the grand mean of the trial, expressed as a percent. On the western side of Indiana a normal C.V. for soybeans is 5 to 10 percent; whereas on the eastern side it is 10 to 15 percent. Whenever the C.V. is larger than normal for a trial location, it indicates the precision of the trial was below normal. When yields are high and the experimental error is small, the C.V. will be small.

Single-year trials, in this report, generally require yield differences of 7 to 10 bushels for significance. This year (2000) for single locations, BLSD (k=100) yield differences for significance, ranged from 4.7 to 14.6 bushels per acre.

A test of significance must be performed to determine if the yield difference between two entries is due to experimental error or due to the yielding ability of the entries. The single-year trial only reflects what happened in one year at one location, and is generally inadequate for predicting how the soybeans may perform in the future. Data from multiple years, and in some instances multiple locations, when combined and analyzed, provide a superior estimate of how soybeans will perform in the future.

Generally a minimum of three years of testing are needed, from a trial location, to obtain adequate data for predicting performance.
An analysis of variance, which includes years, will show that years have a very strong influence on yields. Also, an analysis of variance that includes locations will show that locations also influence the performance of the entries in the trial.

Brief periods of favorable or unfavorable weather, when the plants are vulnerable to weather stress, can change the yield relationship among entries from year to year. Maturity relationships are photoperiod influenced and are much less affected by weather from year to year.

Often it is not beneficial or appropriate to combine data across locations from these performance trials. The trials are far enough apart from north to south that the entries in the trial may not be adapted to both locations. The trial environments from east to west are also very different, especially in regard to the presence and severity of Phytophthora rot. It is important to realize that locations may all provide similar trial results one year and produce quite different results the following year.

This year (2000) data combinations were made, from selected locations, for maturity groups II and III, (conventional and Roundup Ready® soybeans), in conventional tillage. None of the year-2000, multiple-location yield data were, statistically, significant.

Data were combined for conventional soybeans, maturity group II (in conventional tillage), at locations 1 and 2, for year-2000 trials only, and are reported in table 29.

Data were combined for maturity group III conventional soybeans (in conventional tillage) for year-2000 trials, at locations 1, 2, 4 and 5, and are reported in table 30.

Data were combined for maturity group II Roundup Ready® soybeans (in conventional tillage) at locations 1 and 2, for year-2000 trials only, and are reported in table 31.

Data were combined for maturity group III Roundup Ready® soybeans (in conventional tillage) for year-2000 trials, at locations 2 and 3, and are reported in table 32.

This year (2000) results of maturity group IV trials were not combined across locations.

Soybean data from any source must include years (preferably three), must be analyzed, and must have a test of significance before it has any value as a basis for performance prediction.

Trial results are ranked by yield. The Waller-Duncan Bayesian k ratio t test is used for the test of significance. A k ratio of 100:1 was used in computing the Bayesian least significant difference (BLSD) for the test of significance. This ratio may be considered in a loose sense to take the place of the 5% level of significance. The BLSD value may be used to make all possible pair-wise comparisons among the entries. Yield differences smaller than the BLSD value should be considered due to chance (experimental error) and not due to superior performance.

An asterisk (*) is included in the yield column in each sub-table. The asterisk denotes all yields in the sub-table which are not, statistically, significantly different from the top yield. Do not place undue emphasis on yield differences followed by an asterisk. The BLSD value must still be used to determine if the particular yields being compared are significantly different.

At Location 1, April weather prepared the way for an excellent soybean planting season. Precipitation was 3.91 inches and arrived in showers of less than 1.2 inches. Temperatures were moderate, with day temperature averaging 58° F and night temperature averaging 35° F.

May was relatively warm and dry. Precipitation totaled 3.21 inches and arrived in showers of less than two-thirds of an inch. Day temperature averaged 73° F and night temperature averaged 51° F.

Both conventional and Roundup Ready® soybean plots were planted May 8 in excellent (conventional tillage) seedbeds. Emergence was uniform, plant growth vigorous, and good stands were obtained.

June was the wet month of the growing season with 8.49 inches of rain. Showers were generally in amounts of less than 1.5 inches, except for 2.58 inches, which fell on June 21. Temperatures were mild; day temperatures averaged 79° F and night temperatures averaged 58° F. On June 9, 10 and 11, 90° F temperature was recorded, and this was the highest summer temperature until August.
July rain totaled 2.20 inches and daytime temperatures ranged from lows of 73° to a high 89° F. In these conditions, soybeans made good progress.

August precipitation was 3.92 inches with substantial rains falling on August 7 (1.78 inches) and August 18 (1.42 inches). Temperatures were generally mild. On August 16, and again on August 30 and 31, temperatures reached 91°, 91° and 90° F, respectively.

September rain was well distributed with daily showers from September 10 through 16. Total for the month was 3.86 inches. The first three days of September had temperatures above 90° F and on September 20 temperature reached 90° F again. Otherwise, temperatures were mild and dry weather provided excellent conditions for maturing soybeans.

The soybean trials were mature, before frost arrived, and were harvested on October 3.

Compared with previous years, the conventional soybeans, year-2000 trials, had higher yields, maturity dates were earlier, and other traits similar. The performance data are representative of 2000 growing conditions in northwestern Indiana and should be useful for performance comparisons.

This is the first year for Roundup Ready® performance trials at the Pinney-Purdue Agricultural Center. The early trial (maturity groups I and II) produced high yields, but the yield differences were not, statistically, significant. The late trial (maturity group III) produced high yields and the yield differences were, statistically, significantly different. The maturity group III trial should be useful in making yield comparisons, within the limitations of single-year single-location data.

At Location 2, April was mild, but extremely dry. Day temperature averaged 62° F and night temperature averaged 38° F. Light showers of one-quarter of an inch, or less, brought the precipitation total for the month to 1.05 inches.

Soil moisture improved during May. On May 2, rain provided 0.82 of an inch of much needed moisture. At location 2, conventional and Roundup Ready® soybeans were planted in conventional tillage seedbeds. Both the Roundup Ready® trials (maturity group II and maturity group III), and the maturity group II conventional soybeans trial, were planted on May 5. At the end of the day, on May 5, a severe thunderstorm with rain (0.49 inches) and hail prevented planting the conventional soybeans, maturity group III, trial. Wet weather delayed planting of the conventional soybeans, maturity group III, trial until May 15. All of the trials had good emergence and vigorous, uniform stands. Rainfall total for the month was 5.83 inches, and came in beneficial showers of less than 1.2 inches. Daytime average temperature was 74° F. Night temperature averaged 54° F.

Moisture distribution during June was ideal. Rain totaled 6.24 inches with all of it coming in amounts of less than 1.5 inches. Only two days in June had temperature of 90° F or higher. Day temperature for the month averaged 80° F and night temperature averaged 59° F.

July was the wet month of the growing season. On July 10 one of the heaviest rains recorded, on the Agronomy Research Center (4.36 inches), caused widespread, damaging flooding. The rain impacted all of the soybean trials, reported in this bulletin. Each plot was carefully examined, to determine the extent of water-damage, and, at harvest, was treated as a missing plot if damage was detected. For July, rain totaled 7.11 inches. Temperatures were mild, with no daytime high temperature reaching 90° F.

August was dry. Rain totaled 1.66 inches for the month, and most of the moisture came in insignificant showers. Dry weather had an impact on yields in the trials. Three days in August had high temperatures; August 16 (93° F), August 30 (93° F), August 31 (92° F). Temperatures the rest of the month were mild.

The hot August weather continued into the first 3 days of September, with temperatures exceeding 90° F. Temperatures then moderated until September 12 when 91° F was recorded. September was generally dry with 2.70 inches of rain for the month. Most of the rain came in showers of 0.50 of an inch or less.

All of the soybeans were mature well ahead of the first killing frost. The maturity group II trials were harvested September 19 and the maturity group III trials were harvested September 28.

When using data from the year-2000 soybean trials at location 2, the conventional soybeans (maturity group II and III trials), are similar to previous test years, and may be useful in making performance comparisons. Note the different years for data combinations, due to the loss (hail damage) of the group III trials in 1999.
This year (2000) the Roundup Ready® trials had many new entries, providing for relatively few comparisons across years. This was compounded by the loss (hail damage) of the maturity group III trial in 1999. The maturity group II trial, this year, did not have any, statistically, significant differences.

The maturity group III Roundup Ready® trial received the most (July 10) flood damage, and was dealt with in this manner. Blocks 1 and 2 were not flooded. Block 3 had 14 damaged plots out of 52 plots total, or a 27 percent loss. Block 4 was virtually destroyed, with only 9 plots remaining out of 52 total plots; or an 83 percent loss. The missing data were restored using this procedure. First, Dr. Ellsworth P. Christmas of the Agronomy Department used the SASS computer program to calculate missing plot data for the 14 damaged plots in Block 3. Second, after the data were restored to Block 3, the Vartest computer program, using the Yates Iterative Procedure calculated data estimates for the 43 missing plots in Block 4. The justification for saving (instead of abandoning) the trial is that the data from Blocks 1, 2 and 3 appeared to be valid information. Block 4 is, for all practical purposes, the average of the data from Blocks 1, 2 and 3. This may cause the precision of the trial (as expressed in the BLSD and C.V. values) to appear better than it actually would have been. This should be kept in mind when using the year-2000 data from the Roundup Ready® maturity group III trial.

The Roundup Ready® data this year, from location 2, should be used with caution.

At Location 3, April weather was excellent for the coming planting season. April rain totaled 4.45 inches. Day temperature averaged 61° F and night temperature averaged 36° F.

The soybean trials were planted May 9 in excellent (conventional tillage) seedbeds. Emergence was rapid, and uniform, vigorous stands were obtained. May high temperature averaged 75° F and the low temperature average was 52° F. Rain for the month was 5.0 inches, and arrived in showers of an inch or less.

June rainfall was 5.06 inches, and was distributed among a number of beneficial showers of generally an inch or less. Daytime high temperature averaged 80° F, and no 90° F temperature was recorded.

July moisture was well distributed throughout the month. Total for the month was 5.28 inches. Temperatures were mild with only one day (July 29) with 91° F.

August rain totaled 3.89 inches and was distributed throughout the month. This beneficial moisture distribution, in August, is evident in the yields produced in the trials. Temperatures were mild, with only one day (August 16) with 90° F temperature.

September rain was especially beneficial for the latest maturing soybeans. Rain total for the month was 5.49 inches. Temperatures were mild and the soybeans were not stressed as they developed and matured.

October was dry, with 1.91 inches of rain for the month. Day temperatures averaged 68° F and night temperatures averaged 43° F. Frost was observed on October 7, 12, 13, 29, 30 and 31. None of the plots appeared to be injured by frost. All of the trials were harvested on October 13.

In the conventional soybean trials, yields are much higher when compared to previous test years. Other traits are similar to previous years. Results are typical of yields in east central Indiana this year (2000). The results may be useful in making performance comparisons, but the high yields may not be repeated next year.

This is the first year for Roundup Ready® trials at the Davis-Purdue Agricultural Center. Impressive yields were obtained, but the maturity group II yields were not, statistically, significant. The maturity group III trial had good precision for east central Indiana. The trial results may be useful in comparing performance, provided the limitations of single-year, single-location data are kept in mind.

At location 4, April weather provided excellent conditions for seedbed preparations. Temperatures were mild with day temperature average of 65° F and night temperature average of 40° F. Rain total for the month was 2.61 inches. Rye cover crop was plowed down and conventional tillage seedbeds were prepared for all of the trials.

The trials were planted May 3 in excellent seedbeds. Emergence was rapid, and uniform, vigorous stands were established. Rain total for May was 3.86 inches and was distributed throughout the month in beneficial showers. Day temperatures were generally mild, ranging from 55° to 89° F.

Wet weather began in June, and was to persist through the summer. A heavy rain (3.58 inches) fell on June 17, and rain, for the month, totaled 6.56 inches. Four days in June (2, 13, 14, and 24) recorded temperatures above 90° F.
July was wet, with 8.07 inches of rain for the month. Three days in July (11, 14, and 28) recorded temperatures of 90° F or higher.

August was wetter and hotter than July. August rain totaled 9.39 inches. Seven days (7, 10, 16, 17, 18, 30 and 31) recorded temperatures of 90° F or higher.

Wet weather during the growing season caused lush vegetative growth and severe lodging. Ponding water destroyed the conventional soybean, maturity group IV trial.

Hot weather continued in September with the first four days of the month with temperatures above 90° F. September was dry. Rain totaled 2.29 inches with 1.59 inches falling on September 27.

All of the entries were mature before frost. The Roundup Ready® trials were harvested October 9 and the conventional soybeans, maturity group III, trial was harvested October 11. The conventional soybean, maturity group IV trial was abandoned due to water damage and late-season weeds.

The soybean trials were relocated from Daviess County to Knox County and that may have some influence on performance. The conventional soybeans, maturity group III, trial produced higher yields, matured earlier, had more lodging, and taller plant height, than in previous test years. The results represent the growing season in southwest Indiana this year and should be used with caution.

The Roundup Ready® soybean trials produced impressive results, albeit the maturity group IV yields were not, statistically, significant. Plants were tall, and lodging was severe. The results should be used with caution, as with any single-year single-location data.

At Location 5, April rain totaled 5.75 inches. Day temperatures averaged 75° F and night temperatures averaged 26° F. The last week of April was dry.

Light showers were frequent during the first 10 days in May. Trials conducted in conventional seedbeds were planted May 12. Trials conducted in no-till seedbeds were planted May 26. Emergence was rapid, and good stands were obtained.

June rain arrived in beneficial showers, scattered throughout the month, and totaled 4.45 inches. Day temperatures reached 90° F on two days (June 11 and 12).

July moisture was distributed throughout the month, and totaled 4.43 inches. Temperatures were mild, with no 90° F temperatures recorded.

August was wet, with 7.8 inches of rain for the month. High temperature reached 90° F only on August 9.

September rain total was 4.22 inches and temperatures were mild. The highest day temperature was 88° F.

All the plots were mature prior to frost. The trials were harvested on October 12.

The year-2000 conventional soybeans in conventional tillage produced higher than normal yields, and in other traits were similar to previous years. The trials should be useful for making performance comparisons for production in southeastern Indiana.

The Roundup Ready® trials in conventional tillage seedbeds produced higher than normal yields and, in other traits, were similar to previous years. However, none of the entries in either the maturity group III or IV trials were, statistically, significantly different from the highest yield in the sub-table.

Conventional soybeans in no-till seedbeds produced higher yields this year. Other traits were similar to previous years. The maturity group III trial had yields which were, statistically, significantly different. The maturity group III trial may be useful for making performance comparisons. The maturity group IV trial did not produce yields which were, statistically, significantly different.

Roundup Ready® soybeans in no-till seedbeds produced higher yields this year. Other traits were similar to previous years. The maturity group III trial had yields which were, statistically, significantly different. The maturity group III trial may be useful for making performance comparisons. The maturity group IV trial did not produce yields which were, statistically, significantly different.

SOURCES OF SEED

Information concerning certified seed may be obtained from the Indiana Crop Improvement Association, which certifies seed from both public and private sources. Publicly developed varieties, presented in this bulletin, are listed under the Indiana Crop Improvement Association, and the Ohio Seed
Improvement Association addresses. Private
companies have requested that inquiries concerning
proprietary entries, presented in this bulletin, be
directed to the addresses listed on the following pages.

Small case letters preceding the entry name are:
v-variety, m-mixture (blend), and b-brand. Other
names, associated with the entry name, are brand or
company names usually associated, in the trade, with
the entry name.

**AgriPro Seed**

4850 West 350 North
Danville, Indiana 46122
Telephone: 317-745-4103

- v AP 2889 AgriPro
- v AP 2949 RRN AgriPro
- v AP 3009 AgriPro
- v AP 3083 RR AgriPro
- v AP 3385 RRN AgriPro
- v AP 3510 AgriPro
- v AP 3525 AgriPro
- v AP 3880 AgriPro

**Battleground Industries, L.L.C.**

2265 West 600 North
West Lafayette, Indiana 47906
Telephone: 765-463-4455

- b BG 293
- b BG 301
- b BG 302 RR
- b BG 333 RR
- b BG 345
- b BG 355 RR
- b BG 363
- b BG 379 RR
- b BG 388 RR

**Beck’s Superior Hybrids, Inc.**

6767 East 276th Street
Atlanta, Indiana 46031
Telephone: 317-984-3508

- b Beck 243 RR
- b Beck 263 RR
- b Beck 289
- b Beck 290 RR
- b Beck 297 NSTS
- b Beck 323 RR
- b Beck 336 NRR
- b Beck 337 STS

**Beck’s Superior Hybrids, Inc., continued.**

6767 East 276th Street
Atlanta, Indiana 46031

- b Beck 349
- b Beck 351
- b Beck 352 RR
- b Beck 372 RR
- b Beck 376 NRR
- b Beck 379 N
- b Beck 385 N RR
- b Beck 386
- b Beck 402 RR
- b Beck 419
- b Beck 476 N RR

**Dairyland Seed Company, Inc.**

P. O. Box 958, 3570 Highway H
West Bend, Wisconsin 53095
Telephone: 800-236-0163

- v DSR-243
- v DSR-254 RR
- v DSR-272 RR
- v DSR-275
- v DSR-280 STS
- v DSR-293 RR
- v DSR-299 STS
- v DSR-300
- v DSR-303 RR
- v DSR-309 STS
- v DSR-321 RR
- v DSR-325
- v DSR-327 RR
- v DSR-338 STS
- v DSR-357 RR
- v DSR-363 RR
- v DSR-371 STS
- v DSR-377
- v DSR-381 RR
- v DSR-395 RR
- v DSR-400 STS
- v DSR-421 RR

**Davis Seed Farms, Inc.**

10184 Ted Davis Road
Greens Fork, Indiana 47345-9753
Telephone: 765-886-5148

- b Davis D340 STS
- b Davis D350 N
- b Davis D360
- b HP 3502 RR
- b HP 3693 RR
Diener Brothers Seeds, Inc.
371 North Diener Road
Reynolds, Indiana 47980
Telephone: 219-984-5837

- b Diener DB 289
- b Diener DB 2900CR
- b Diener DB 2977RR
- b Diener DB 302
- b Diener DB 3310CR
- b Diener DB 3366RR
- b Diener DB 337
- b Diener DB 3500CR
- b Diener DB 3630RR
- b Diener DB 377
- b Diener DB 3775CR
- b Diener DB 3900CR

Garst Seed Company
2369 330th Street
Slater, Iowa 50244
Telephone: 800-831-6630

- b D265 Garst
- b D269RR Garst
- b D308 Garst
- b D333RR/N Garst
- b D350 Garst
- b D355RR Garst
- b D370RR Garst
- b D398 Garst
- b D399RR/N Garst

Glick (Lynn and Myron) Seeds
15120 East Baseline Road
Columbus, Indiana 47203
Telephone: 812-579-6924

- b L&M Glick 319RR
- b L&M Glick 37RR
- b L&M Glick 3A7NRR
- b L&M Glick 40RR

Indiana Crop Improvement Association
7700 Stockwell Road
Lafayette, Indiana 47909
Telephone: 765-523-2535
Fax: 765-523-2536

- v Archer Public
- v Athow Public
- v Chapman Public
- v Charleston Public
- v Dwight Public
- v Flyer Public
- v General Public
- v IA 2051 Public
- v Jack Public
- v Kenwood 94 Public
- v Maverick Public
- v NE 3201 Public
- v NE 3801 Public
- v Omaha Public
- v Pella 86 Public
- v Probst Public
- v Rend Public
- v Resnik Public
- v Saline Public
- v Williams 82 Public
- v Yale Public

LG Seeds
1122 East 169th Street
Westfield, Indiana 46074
Telephone: 800-671-2326

- b C7317
- b C8275
- v C3201
- v C3333RR
- v C3505RR
- v C3545
- v C3767RR
- v C9284RR

Martin Seeds, Inc.
10045 West Second Street
Williamsport, Indiana 47933
Telephone: 765-986-2030

- b M-0035
- b M-0131STS
- b M-9928
- b M-9929
- b M-9932
- b M-Resister
Miles Farm Supply, L.L.C.  
P.O. Box 22879, 2760 Keller Road  
Owensboro, Kentucky 42304-22879  
Telephone: 270-926-2420

v Solomon SouthCross  
v Titus SouthCross

Monsanto  
3100 Sycamore Road  
DeKalb, Illinois 60115  
Telephone: 815-758-9323

v AG2602 Asgrow  
v AG2703 Asgrow  
v AG3003 Asgrow  
v AG3302 Asgrow  
v AG3702 Asgrow  
v AG3901 Asgrow  
v AG4301 Asgrow  
v CX444CRR DeKalb  
v DK B32-51 DeKalb  
v DK B35-51 DeKalb  
v DK B36-51 DeKalb  
v DK B38-51 DeKalb

NextGene Seed  
355 Smith Road  
Greensburg, Indiana 47240  
Telephone: 812-663-5575

b NG 1036R  
b NG 1037  
b NG 1044R  
b NG 1128R  
b NG 1139R  
b NG 2140  
b NG 2909  
b NG 3809  
b NG 425R  
b NG 5138STS  
b NG 9029R  
b NG 9032 STS  
b NG 9034R  
b NG 9144

Novartis Seeds  
6642 Manchester Drive  
Fishers, Indiana 46038  
Telephone: 317-578-0601

v S25-J5 NK  
v S29-C9 NK  
v S30-P6 NK  
v S32-Z3 NK  
v S34-B2 NK  
v S39-D9 NK  
v S46-G2 NK  
v S46-W8 NK

Ohio Seed Improvement Association  
6150 Avery Road Box 477  
Dublin, Ohio 43017-0477  
Telephone: 614-889-1136

v Defiance Public  
v Sandusky Public

Royster-Clark, Inc.  
70 North Market Street  
Mt. Sterling, Ohio 43143  
Telephone: 740-869-2181

b Vigoro 400 NRR  
b Vigoro V281 RR  
b Vigoro V330 NRR  
b Vigoro V332 RR  
b Vigoro V352 NRR  
b Vigoro V360 STS  
b Vigoro V361 RR  
b Vigoro V362 SCN  
b Vigoro V391 NRR

Rupp Seeds, Inc.  
17919 County Road B  
Wauseon, Ohio 43567  
Telephone: 419-337-1841

v Rupp RS 2345  
v Rupp RS 2499  
v Rupp RS 3119  
v Rupp RS 4241RR  
v Rupp RS 4265RR  
v Rupp RS 4289RR  
v Rupp RS 4309RR
Seed Consultants, Inc.
P.O. Box 96, 9768 Mill-Jeff Road
Jeffersonville, Ohio 43128
Telephone: 740-426-8644

b SC 350N  SeedCslt
b SC 388  SeedCslt
b SC 406  SeedCslt
b SC 9288RR  SeedCslt
b SC 9320RR  SeedCslt
b SC 9351RR  SeedCslt
b SC 9382RR  SeedCslt
b SC 9388RR  SeedCslt
b SC 9441RR  SeedCslt
b SC 5348STS  SeedCslt
b SC 9438RR  SeedCslt

Trisler Seed Farms, Inc.
3274 East 800 North
Fairmount, Illinois 61841
Telephone: 217-288-9301

v Trisoy 2770
v Trisoy 2807RR
v Trisoy 2997RR
v Trisoy 3252
v Trisoy 3297RR
v Trisoy 3300
v Trisoy 3597RR
v Trisoy 3707RR

Wyckoff Hybrids, Inc.
594 East 400 North
Valparaiso, Indiana 46383
Telephone: 219-462-6716

b H Pride 365RR
b H Pride 3992CRR
b H Pride 4102CRR
v H Pride 285RR