PERFORMANCE OF
PUBLIC AND PRIVATE
SOYBEANS
IN INDIANA, 2001

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West Lafayette, Indiana
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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 2001 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.

This information is presented under authority granted Indiana Agricultural Research Programs to conduct performance trials, including interpretation of data to the public, and does not imply endorsement or recommendation by Purdue University. Also any soybean not included in this bulletin does not imply criticism by Purdue University. This bulletin is protected by copyright by the Purdue Research Foundation. Permission is granted to reproduce the tables only in their entirety provided that this bulletin, "Performance of Public and Private Soybeans in Indiana", is referenced and the data are not edited, manipulated or reinterpreted. The table number, title, heading and footnotes 1 and 2 must be included. Permission is also granted to reproduce a maturity-group sub-table provided that the complete sub-table, table heading and footnotes are included with the sub-table. A conspicuous disclaimer which states "endorsement or recommendation by Purdue University is not implied" must accompany any information reproduced from this bulletin.

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http://www.agry.purdue.edu/ext/variety.htm

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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 2001, 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. Drummer was formerly classified as Chalmers.

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 2001, 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 blocks 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 3.0 to 4.25 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 the 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, following corn, 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 Roundup Ready® soybean 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 tillage (seedbed) trials, (planted using the Almaco Drill, with 10 rows on 7.5 inch spacing), were calculated as 75 inches wide. The no-till (seedbed) trials, performed by Dr. E. P. Christmas using the Great Plains 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 Workabout (computer). 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 2001 growing season, issued April 9, 2001, indicated Indiana topsoil moisture ratings as 6 percent very short, 22 percent short, 66 percent adequate and 6 percent surplus. Subsoil moisture ratings were essentially the same as the topsoil moisture ratings. Moisture improved during mid-April to 85 percent adequate to surplus.

By the week ending April 22, soybean planting was under way in a few scattered fields. Planting continued ahead of normal during the last half of April.

Planting progressed rapidly during the first week of May, and by the end of the week, 52 percent of the crop was planted. Fourteen percent planted is normal for the first week of May. By mid-May, 80 percent of the crop was planted compared with 29 percent for normal. Planting was 94 percent complete by the week ending May 20. Soil moisture was rated 13 percent very short, 18 percent short, 58 percent adequate and 11 percent surplus. Soil moisture, statewide, did not improve until the latter part of May.

During early June the soybean condition declined due to lack of moisture. In mid-June the soybean crop began to improve due to the arrival of much needed rain.

The report for the week ending July 8, reported 27 percent of the soybean crop was blooming compared to 21 percent for average. The crop was rated 66 percent good to excellent. A week later, July 15, pods were setting in 17 percent of the crop. At the end of July, 50 percent of the crop was setting pods, and the crop was rated 72 percent good to excellent.
The first half of August was hot, and in some areas of the state (northeast and southwest Indiana), soils were very dry. During mid-August the soybean condition declined from 73 percent to 64 percent, good to excellent. By the week ending August 19, leaves were shedding in about 3 percent of the crop. During the last half of August, soil moisture improved over most of the state. Topsoil moisture was rated 71 percent adequate and 6 percent surplus.

Two percent of the soybean crop was mature by the week ending September 2. Soil moisture was rated 72 percent adequate and 7 percent surplus. This provided excellent moisture for pod filling for most of the crop. The crop was rated 72 percent good to excellent during the week ending September 9. During the week ending September 16, two percent of the soybean acreage was harvested. September moisture remained very favorable and mid-September harvest continued at a normal pace. During the last half of September, rain showers slowed harvesting to a slower than normal pace.

October began with soybean harvest making good progress around the state. By the first week of the month, the crop was 44 percent harvested compared with 41 percent for average. Rain began during the second week of October and soil moisture was rated 95 percent adequate to surplus. Soil moisture increased to 26 percent adequate to 74 percent surplus by the end of the month.

Wet fields delayed soybean harvesting during mid to late October and in early November. The final crop report for the 2001 growing season, reported the soybean crop 99 percent harvested, which was on par for average. Soil moisture was rated 1 percent very short, 7 percent short, 80 percent adequate and 12 percent surplus. Subsoil moisture ratings were similar to topsoil ratings.

In summary, the 2001 soybean crop was planted in very dry soil over much of the state. Emergence, in the driest areas, was slow, but adequate stands were generally established. During the critical period from mid-August to mid-September, very favorable moisture was well distributed over much of Indiana. Pod fill benefited from the moisture and favorable yields were obtained. Rain, during October, delayed timely harvest over most of the state, but field conditions improved to permit harvesting before winter arrived.

On October 22, 2001 the Indiana Agricultural Report presented the following information concerning soybean production in Indiana in 2001.

"In contrast to last year, public soybean varieties rose to 1.4 percent of the total 5.8 million acres planted in 2001. Private varieties totaled 92.4 percent of Indiana's soybean acreage in 2001 (up 1 percent from 2000). Leading the way again this year was Pioneer with 22.7 percent. Second place went to Asgrow with 17.5 percent, and Becks came in third place with 10.5 percent of the total soybean acreage. DeKalb ranked fourth with 5.4 percent. Unidentified varieties accounted for 6.2 percent of the acreage in 2001."

"Indiana farmers practiced conventional tillage on 12.2 percent of the planted acreage and minimum tillage on 18.1 percent of the planted acres, the remaining 69.7 percent were planted with no-till."

On November 20, 2001 the Indiana Agricultural Report presented the following information:

"Based on conditions November 1, 2001 .... Indiana soybean production is forecast at 283.2 million bushels, unchanged from the October forecast, and 12 percent above last year's production of 252.1 million bushels. The expected yield of 49 bushels per acre is unchanged from last month's forecast and 3 bushels above last year's yield of 46 bushels per acre. The 5.78 million acres for harvest, is 5 percent above last year's level, but unchanged from October."
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, 22 of the 2001 trials are significant at the 10 percent probability level, and 2 trials are not. The 2001 trials, which are not significant, at the 10 percent probability level are:

- Table 24, conventional soybeans, maturity group IV in conventional tillage.
- Table 27, conventional soybeans, maturity group IV in no-tillage.

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 (2001) for single locations, BLSD (k=100) yield differences for significance, ranged from 3.9 to 19.0 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 several 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 (2001) data combinations were made, from selected locations, for maturity groups II, III and IV (conventional and Roundup Ready® soybeans), in conventional tillage. Conventional soybeans, maturity groups II and III of the 2001, multiple-location yield data were, statistically, significant, and maturity group IV was not. Roundup Ready® maturity groups II and IV of the 2001, multiple-location yield data were, statistically, significant, and maturity group III was not.
Data were combined for conventional soybeans, maturity group II (in conventional tillage), at locations 1 and 2, for 2001 trials only, and are reported in table 32, page 36.

Data were combined for maturity group III conventional soybeans (in conventional tillage) for 2001 trials, at locations 1, 2, 3, 4 and 5, and are reported in table 33, page 37.

Data were combined for maturity group IV conventional soybeans (in conventional tillage) for 2001 trials, at locations 4 and 5, and are reported in table 34, page 37.

Data were combined for maturity group II Roundup Ready® soybeans (in conventional tillage) at locations 1 and 2, for 2001 trials only, and are reported in table 35, page 38.

Data were combined for maturity group III Roundup Ready® soybeans (in conventional tillage) for 2001 trials, at locations 2, 3 and 4, and are reported in table 36, page 38.

Data were combined for maturity group IV Roundup Ready® soybeans (in conventional tillage) for 2001 trials, at locations 4 and 5, and are reported in table 37, page 39.

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, March was dry with 0.52 of an inch of precipitation. April showers came in light rains of generally less than half an inch. Total rainfall for the month was 2.68 inches. During the first week of April, temperatures warmed rapidly and by the second week, high temperatures reached 78° F.

May was warm, with the first 90° F temperature arriving on May 16. Rainfall was distributed among frequent, timely showers of generally less than one inch. The heaviest rain (1.11 inches) was on May 15. Total rain for the month was 4.15 inches. All of the soybean trials, at location 1, were planted on May 8, in excellent seedbeds. Emergence was uniform and vigorous, and excellent stands were established. The trials developed, during the growing season, without visible stress from moisture or temperature extremes.

Hot weather arrived in June. The first week in June had temperatures in the 60° F range. Then, at the beginning of the second week of June, and continuing to the end of the month, temperatures were frequently in the high 80° F range. Temperatures of 90° F or above occurred on June 12, 14, 15, and 19. All rain showers, for the month, came in amounts of less than one inch. Rain totaled 3.99 inches.

July had 7 days with temperatures of 90° F or above. The largest rain (1.27 inches) came on July 24. Other precipitation came in showers of half an inch or less. Precipitation total for the month was 4.51 inches.

August rain totaled 5.92 inches. On August 26, 2.63 inches of rain fell, and the rest of the moisture came in showers of less than an inch. The first two days of August had temperatures above 90° F and August 6 was the last 90° F temperature of the growing season. The rest of the month was generally mild with daytime high temperatures ranging from 63° to 87° F.

Excellent weather continued in September. Daytime high temperatures ranged from 87° to 53° F and rain totaled 3.19 inches for the month. All of the plots were mature prior to frost. From May 1 through September 30, the trials received 21.76 inches of rain.

October was wet, with 8.75 inches of rain for the month. The early trials (maturity groups I and II) were harvested October 3, and the late maturing trials (maturity group III) were harvested October 19.

Precision, in all of the trials, was good and the data, when used with multiple-year data, should be useful in comparing performance among the entries.
**At Location 2.** March was dry, with 0.46 of an inch of moisture. April rain totaled 2.77 inches and May 2.92. During the first week of May, high temperatures were generally above 80° F. On May 16 and 17 daytime high temperature reached 93° and 94° F respectively. During the last 9 days of the month, daytime temperatures ranged from 76° to 63° F and night temperatures 53° to 61° F. This cool temperature persisted the first 10 days in June and cause internode length (and plant height) to be shorter. Only one rain in May (1.38 inches on May 18) provided any significant moisture. The soybean trials were planted May 3 and 4 in a very dry seedbed. Dry soil, and two weeks of dry weather after planting, delayed the establishment of good stands. Emergence was slow and was not uniform. Stands were not well established until the end of May.

Mid-June temperatures exceeded 90° F for six days and June precipitation was 2.28 inches. Beneficial rain (1.93 inches) arrived during the first week of July. Rain for July totaled 4.81 inches, with more than half arriving during the first week. Five days in July had temperatures at or above 90° F.

The soybean trials, after getting off to a very slow start, entered August in good shape. Stands were adequate and the condition of the trials had improved remarkably. Seven days in August had temperatures of 90° F or above. The last day of the growing season to reach 90° + F was August 23. Rain showers were well distributed with most of the precipitation coming the last half of the month. Rain for the month totaled 5.03 inches.

September temperatures were moderate with daytime high temperatures ranging from 88° to 57° F. September was drier, with 1.79 inches of rain. All entries in the trials were mature before frost. Conditions were ideal for harvesting the early maturing (maturity group II) trials on September 27 and 30.

From May 1 through September 30, the trials received a total of 16.83 inches of rain.

Heavy rain arrived in mid-October and rain for the month totaled 8.89 inches. The late maturing trials (maturity group III) were harvested October 29 in very muddy soil.

Results of the 2001 trials at location 2, used in conjunction with previous year's results, should be useful in comparing performance among the entries in the trials. The results demonstrate how soybeans can recover from a less-than-ideal start, and produce good yields.

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**At Location 3.** March was dry, with 0.99 of an inch of moisture. April rain, in a number of beneficial showers, totaled 3.52 inches. May rain totaled 5.54 inches, and was distributed throughout the month in showers of less than 1 inch. Temperatures were warm and mild, but no high temperature reached 90° F. Temperatures were cool the last week of May and the first two weeks in June. The soybean trials were planted, May 10, in a firm, moist seedbed. Emergence was uniform, and vigorous stands were established. June rain totaled 3.27 inches, and 4 days had temperatures of 90° F or above. Favorable weather continued in July with temperatures of 90° F, or above, on 7 days during the month. Precipitation was distributed throughout the month and totaled 4.60 inches.

Four of the first 10 days of August had temperatures of 90° F, or above. Temperatures the rest of the month ranged from 70° to 89° F. Most of the rain came in the last half of August. Total for the month was 6.50 inches. The weather was ideal for soybean production.

September rain totaled 4.20 inches and was distributed throughout the month. Daily high temperatures ranged from 88° F (September 8) to 52° F (September 26). From May 1 through September 30 the trials received 24.11 inches of rain. All of the entries were mature before frost.

October rain, which totaled 7.37 inches for the month, prevented timely harvest of the trials. From October 11 through October 17 rain occurred every day. All of the trials were finally harvested on October 30 in very muddy fields. No shattering was observed in the plots.

The trial results, in conjunction with multiple-year averages, should be useful in comparing performance among the entries.
At location 4, March precipitation totaled 0.71 of an inch. April was dry with 1.20 inches of rain. Dry weather continued in May with rain for the month totaling 2.11 inches. May weather was warmer with both day and night temperatures averaging approximately 20\(^\circ\) F higher than April temperature averages. The trials were planted May 9 in a firm, moist seedbed. Emergence was rapid and uniform, although there was no precipitation for 8 days following planting. Daytime high temperature reached 92\(^\circ\) and 93\(^\circ\) F on May 16 and 17 respectively.

June received 4.52 inches of rain, but moisture distribution was not ideal. During the first 6 days of June, 3.5 inches of rain fell. The during the next 14 days, only one rain (0.01 of an inch) was recorded. On June 21 and 22, 1.01 of an inch of rain fell. In mid-June, 7 days had high temperature above 90\(^\circ\) F.

July had 14 days with temperatures of 90\(^\circ\) F or above. July had 5 beneficial rains (6.05 inches total) which came in intervals of 4 to 9 days apart. Soil moisture, at the end of the month, was excellent.

Nine of the first 10 days in August had temperatures above 90\(^\circ\) F and there was virtually no rain during the first half of the month. Nearly all August rain arrived the last 10 days of the month and rain for the month totaled 4.0 inches. Soil moisture was adequate during the critical pod-filling period.

Four of the first 7 days in September had temperatures above 90\(^\circ\) F and this was the last 90\(^\circ\) F weather of the growing season. Rain was well distributed throughout the month with virtually all of it arriving by September 20. Total for the month was 3.73 inches.

Data from other locations or from multiple-year averages may be more useful for making comparisons among the entries than the 2001 trial results at location 4.

At Location 5, March had 1.13 inches of precipitation and April had 3.03 inches. May daytime temperatures ranged from 60\(^\circ\) to 85\(^\circ\) F, and rainfall totaled 4.85 inches. Distribution of the rain was ideal, with most of it coming in the middle of the month, in showers of less than an inch.

The no-till trials for both conventional and Roundup Ready\(^\text{®}\) soybeans were planted by Dr. E. P. Christmas on May 3. The conventional and Roundup Ready\(^\text{®}\) soybeans in conventional tillage were planted May 11. All trials were planted in good seedbeds and soil moisture was adequate for rapid germination. Emergence was uniform, and vigorous stands were established.

June rain totaled 5.08 inches, and was distributed throughout the month. Two days (June 13 and 14) had 90\(^\circ\) and 91\(^\circ\) F respectively.

Four days in July (23, 24, 30 and 31) had temperatures of 90\(^\circ\) F or above. Rain was distributed throughout the month and totaled 5.62 inches. Five of the first 8 days of August had temperatures of 90\(^\circ\) F or above. This was the last 90\(^\circ\) F weather of the growing season. Rainfall was well distributed (most came after the middle of the month) and totaled 5.28 inches.

September conditions were nearly ideal for late maturing and ripening soybeans. The highest daytime temperature in September was 86\(^\circ\) F and was recorded on September 4, 8 and 13. Most of the September rain came on September 7, 8 and 9. Rain for the month totaled 5.42 inches.

From May 1 through September 30, the trials received 26.25 inches of rain. All of the entries were mature before frost and were harvested on October 8 and 9, prior to the heavy October rains.

The trial results, when used in conjunction with multiple-year data, may be useful in comparing performance among entries.
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.

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 302RR
b BG 333RR
b BG 345
b BG 355RR
b BG 363
b BG 379RR
b BG 388RR

Beck's Superior Hybrids, Inc.
6767 East 276th Street
Atlanta, Indiana 46031
Telephone: 317-984-3508

b Beck 243RR
b Beck 264RR
b Beck 283RR
b Beck 288
b Beck 323RR
b Beck 336NRR
b Beck 349
b Beck 352RR
b Beck 367NRR
b Beck 376NRR
b Beck 387NRR
b Beck 402RR
b Beck 417NRR
b Beck 419
b Beck 437NRR

Crow's Hybrid Corn Co.
14575 University
Waukee, Iowa 50263
Telephone: 515-226-3126

b Crow's C2615R
b Crow's C29009RN
b Crow's C2915R
b Crow's C3115R
b Crow's C3315R
b Crow's C3515R
b Crow's C3715R
b Crow's C3915R
b Crow's C4118R
b Crow's C4417R
b Crow's C48009RN

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

v DSR-265/STS
v DSR-268/RR
v DSR-272/RR
v DSR-280/STS
v DSR-289/STS
v DSR-290/RR
v DSR-299/STS
v DSR-300
v DSR-301/RR
v DSR-303/RR
v DSR-309/STS
v DSR-321/RR
v DSR-322/RR
v DSR-338/STS
v DSR-357/RR
v DSR-363/RR
v DSR-371/STS
v DSR-375/RR
v DSR-395/RR

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

b Davis D350N
Diener Seeds, Inc.
371 North Diener Road
Reynolds, Indiana 47980
Telephone: 219-984-5837

- b Diener D 2788CR
- b Diener D 294C
- b Diener D 302
- b Diener D 324
- b Diener D 3267R
- b Diener D 3501CR
- b Diener D 3520CR
- b Diener D 361C
- b Diener DB 2977RR
- b Diener DB 3630RR
- b Diener DB 3921RR

Great Lakes Hybrids, Inc.
9915 West Michigan 21
Ovid, Michigan 48866
Telephone: 517-834-2251

- b GL 2704RR
- b GL 2919RR
- b GL 3409RR
- b GL 3619RR
- b GL 4109RR

Garst & AgriPro Seed Company
2369 330th Street, P.O. Box 500
Slater, Iowa 50244
Telephone: 800-831-6630

- b 2933RR Garst
- b 3083RR Garst
- b 3792RR/N Garst
- b 4312RR/STS/N Garst
- b D294RR/N Garst
- b D308 Garst
- b D333RR/N Garst
- b D350 Garst
- b D355RR Garst
- b D370RR Garst
- b D398 Garst
- b D399RR/N Garst

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 Dwight Public
- v Flyer Public
- v General Public
- v Jack Public
- v Maverick Public
- v Pella 86 Public
- v Probst Public
- v Rend Public
- v Resnik Public
- v Williams 82 Public
- v Yale Public

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 326R
- b L&M Glick 37RR
- b L&M Glick 3A7NRR
- b L&M Glick 6NR

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

- b M-0035
- b M-0131STS
- b M-9928

Miles Farm Supply, L.L.C.
P.O. Box 22879, 2760 Keller Road
Owensboro, Kentucky 42304-22879
Telephone: 270-926-2420
Telephone: 800-666-4537

- v SC Aaron
- v SC Andrew
- v SC Jeremiah
- v SC Solomon
- v SC Titus
Monsanto  
3100 Sycamore Road  
DeKalb, Illinois 60115  
Telephone: 815-758-9323

v AG 2703      Asgrow  
v AG 2905      Asgrow  
v AG 3201      Asgrow  
v AG 3302      Asgrow  
v AG 3503      Asgrow  
v AG 3903      Asgrow  
v AG 4403      Asgrow  
v DKB 26-51    DeKalb  
v DKB 28-51    DeKalb  
v DKB 31-51    DeKalb  
v DKB 32-52    DeKalb  
v DKB 35-51    DeKalb  
v DKB 38-52    DeKalb

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

v Sandusky Public

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

b Vigoro V280 NRR  
b Vigoro V281 RR  
b Vigoro V352 NRR  
b Vigoro V361 RR  
b Vigoro V363 NRR  
b Vigoro V372 RR  
b Vigoro V382 NRR  
b Vigoro V393 NRR  
b Vigoro V422 NRR  
b Vigoro V442 NRR

Syngenta Seeds, Inc.  
1002 North Old SR 15  
P. O. Box 629  
Milford, Indiana 46542  
Telephone: 219-658-3081

v S25-J5       NK  
v S27-R1        NK  
v S29-C9        NK  
v S30-P6        NK  
v S30-Y8        NK  
v S32-M2        NK  
v S32-Z3        NK  
v S38-E9        NK  
v S39-Q4        NK  
v S46-G2        NK

Stine Seed Company, Inc.  
2225 Laredo Trail  
Adel, Iowa 50003  
Telephone: 800-362-2510

b Stine 2503-4  
b Stine 2736-4  
b Stine 2789-4  
b Stine 3000-4  
b Stine 3183-4  
b Stine 3632-4  
b Stine 3800-4  
b Stine 3808-4

Strike Brand Genetics  
702 SR 28 East, P.O.Box 158  
Romney, Indiana 47981  
Telephone: 765-538-3145

b Strike 2801RR  
b Strike 3101RR  
b Strike 3490ARR  
b Strike 3601NRR  
b Strike 3801NRR

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

v Rupp RS 2499  
v Rupp RS 4278RR  
v Rupp RS 4289RR  
v Rupp RS 4316RR  
v Rupp RS 4328RR
v Trisoy 2907RRN
v Trisoy 2997RRN
v Trisoy 3017RRN
v Trisoy 3211RR
v Trisoy 3407RR
v Trisoy 3607RR
v Trisoy 3704RRN