# 2021
# MICHIGAN SOYBEAN PERFORMANCE REPORT

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This report provides information on the performance of Conventional and Roundup Ready soybean varieties in Michigan in 2021.

The presentation of data for the entries tested does not suggest approval or endorsement of varieties by Michigan State University (MSU).

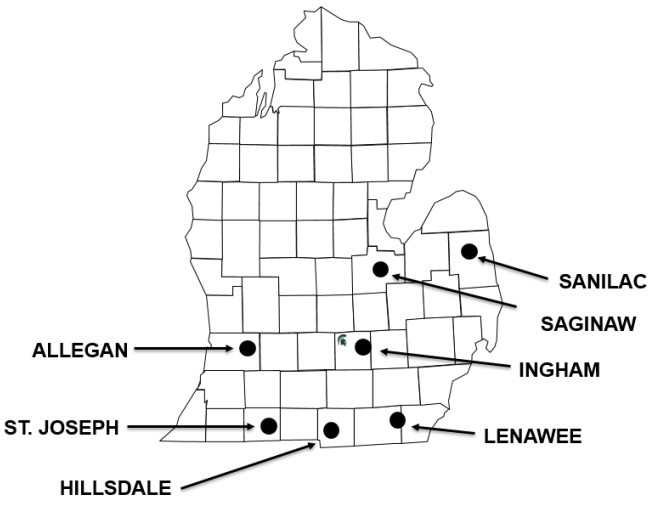
## TESTING PROCEDURES

Seven locations are reported here. The Central locations for the Conventional and Roundup Ready trials include test sites in Allegan, Ingham, Saginaw, and Sanilac Counties. The Southern locations for the Conventional and Roundup Ready trials include test sites in Hillsdale, Ingham, Lenawee, and St. Joseph (irrigated) Counties.

Twenty-one seed companies entered a total of 246 commercial varieties, not including the experimental MSU lines. The cooperators, planting dates, harvest dates, and other site details for the locations are listed below.

Seed was planted in 6-row plots, 20 feet long with 15-inch row spacing, at a depth of 1.5-inches. The planting rate was 160,000 seeds/acre. At each location, varieties were replicated four times in a Randomized Complete Block Design (RCBD). All locations were planted to 17 feet with 3-foot alleys that were not trimmed. Only the center four rows were harvested. Experimental design, data management, and data analysis were conducted with AGROBASE Generation II, (Agronomix Software, Inc., Winnipeg, Canada).

**2021 TEST SITE COUNTY LOCATIONS**




## TEST SITE INFORMATION

**Lenawee County**
Nearest city: Britton
Cooperator: David & Jason Woods
Planting date: 05/19/2021 conventional trials and 05/20/2021 for the Roundup trials
Harvest date: 11/07/2021 to 11/08/2021
Previous crop: Soybeans
Soil type: Clay Loam
Fertilizer: 250# /A K2O
Herbicides: Pre-emerge 12 oz. Authority MTZ, 1.5 pt./A Medal II- Roundup PowerMax 32 oz. over the entire field.
Conventional & Liberty Link Trials- 8 oz./A Cobra 20 oz./A Tapout
Roundup Ready Trials – 32 oz. /A Roundup PowerMax, 20 oz./A Tapout

**Hillsdale County**
Nearest city: Reading
Cooperator: Robert Lennard
Planting date: 05/21/2021
Harvest date: RR trials 10/01/2021, Conv. trials 11/10/2021
Previous crop: Corn
Soil type: Sandy loam
Fertilizer: 160# DAP 18-46-00, 230# Potash 00-00-60
Herbicides: Pre-emerge 12 oz. Authority MTZ, 1.5 pt. /A Medal II- Roundup PowerMax 32 oz. over the entire field.
Conventional trials - 8 oz./A Cobra, 20 oz./A Tapout
Roundup Ready Trials – 32 oz./A Roundup PowerMax, 20 oz./A Tapout

**St. Joseph County - Irrigated**
Nearest city: Mendon
Cooperator: Roger and Anne Gentz and Family
Planting date: 05/08/2021
Harvest date: 11/03/2021 to 11/05/2021
Previous crop: Hybrid Seed Corn
Soil type: Elston Sandy loam
Fertilizer: 250 #/A 0-0-60
Herbicides: Pre-emerge 12 oz. Authority MTZ, 1.5 pt./A Medal II Roundup PowerMax 32 oz. over the whole field

**Ingham County**
Nearest city: Webberville
Cooperator: Walnut-Vu Farm
Planting date: 05-10-2021
Harvest date: 11/18/2021 to 11/19/2021
Previous crop: Corn
Soil type: Loam
Fertilizer: Grid Potash/ MAP
Herbicides: Pre-emerge Authority MTZ 16 oz./A, 1.5 pt./A Medal II 32 oz. Roundup PowerMax
Conventional Trials- 1 qt. Basagran, 5 oz./A Raptor 5 oz./A, 20 oz./A Tapout
Roundup Ready Trials – 32 oz./A Roundup PowerMax, 20 oz./A Tapout

**Allegan County**
Nearest city: Wayland
Cooperator: Ann & Jeremy Biesbrock
Planting date: 05-13-2021
Harvest Date: 11/05/2021 to 11/08/2021
Previous Crop: Corn
Soil Type: Colwood Silt Loam
Fertilizer: 200#/A Potash
Herbicides: Pre-emerge: 16 oz. Authority MTZ, 1.5 pt./A, Medal II- 32 oz. / A Roundup PowerMax over the entire field.
Post-emerge:
Conventional Trials- 1 qt. Basagran, 5 oz./A, Raptor, 20 oz./A Tapout
Roundup Ready Trials – 32 oz./A Roundup PowerMax, 20 oz./A Tapout

**Saginaw County**
Nearest city: Saginaw
Cooperator: Tom Hoff
Planting date: 05/12/2021
Harvest date: 10/18/2021 to 10/20/2021
Previous crop: Corn
Soil type: Clay Loam
Fertilizer: 200#/A Potash
Herbicides: Pre-emerge 16 oz. Authority MTZ, 1.5 pt./A
Medal II - over the entire field 32 oz. Roundup PowerMax
Conventional Trials- 1 qt. Basagran, 5 oz./A Raptor, 20 oz./A Tapout
Roundup Ready Trials – 32 oz./A Roundup PowerMax
20 oz./A Tapout

**Sanilac County**
Nearest city: Sandusky
Cooperator: Gerstenberger Farms, Inc.
Planting date: 05/11/2021
Harvest date: 10/20/2021 to 10/22/2021
Previous crop: Sugar beets
Soil type: Parkhill
Fertilizer: none
Herbicides: Pre-emerge 1.5 pt. /A Medal II, 32 oz. Roundup PowerMax- over the entire field
Conventional Trials- 1 qt. Basagran, 20 oz./A Tapout
Roundup Ready Trials – 32 oz./A Roundup PowerMax
5 oz./A, 20 oz./A Tapout

## GROWING CONDITIONS / COMMENTS

Dry weather during most of the planting season allowed for timely planting of the trials and farm fields, but delayed germination and activation of herbicides in some areas. All of the soybean performance trials were planted by May 21st. Heavy rain and wet weather in June ended the dry spell and continued through July. Enviro-weather data shows the MSU farm on campus received 1.12" of rain May 1st through June 20th, then received 10.04" of rain from June 20th through the end of July. While much of the state remained wet, an area on the west side of the state including the Allegan county location became dry during the late summer. Overall heat units were ahead of the long term average. The cold, wet weather late in October made harvest particularly difficult as rains and dreary weather persisted through most of the state. The Mendon weather station (St. Joseph county) showed some amount of precipitation 25 days in October. The South zone Roundup Ready trials were not harvested at the Ingham county location due to wet weather. Data for the Central Conventional trial in the Sanilac and Allegan locations, and the South Conventional trial in St. Joseph were discarded because of variability.

## USING THE DATA

Results are presented in Tables 1 through 6.

**Yield**: Yield is expressed as bushels per acre at 13% moisture and is reported as single and across site means for 2021. Two- and three-year means are also presented when applicable.

**Height**: Plant height, reported in inches, was measured at maturity from the soil surface to the tip of the main stem. The reported values are means of 4 reps at all sites.

**Lodging**: Lodging scores reflect the erectness of the plants before harvest. The reported values are means of 4 reps at all sites. Ratings are based on the following scale:
1= Almost all plants are erect.
2= All plants leaning slightly, or fewer than 25% of the plants are down.
3= All plants leaning moderately (45%), or 25% to 50% of the plants are down.
4= All plants leaning considerably, or 50% to 80% of the plants are down.
5= Almost all plants are down.

**Protein and Oil Content:** Protein and oil content of the seed was determined using near-infrared reflectance and is expressed on a **DRY MATTER** basis. The analysis was done on seed from all 4 replications from the Ingham location. Protein and oil data is not available for the southern zone Roundup Ready trials because they were not harvested from the Ingham county location due to wet soil conditions.

**Phytophthora Resistance:** Information on the presence of Phytophthora resistance genes was provided by the organizations entering varieties. Varieties denoted with:

- 1a are resistant to phytophthora Races 1, 2, 10, 11, 13-20, 24, 26 & 27.
- 1b are resistant to Races 1, 3-9, 13, 15, 18, 21, & 22.
- 1c are resistant to Races 1-3, 6-11, 13-15, 17, 21, 23, 24 & 26.
- 1k are resistant to Races 1-11, 13-15, 17, 18, 20-24 & 26.
- 3 are resistant to Races 1-5, 8 and 9.
- 6 are resistant to Races 1-4, 10, 12, 14-16, 18-21 & 25.
- 7 are resistant to Races 12, 16, 18 & 19.

**Soybean Cyst Nematode Resistance (SCN):** Seed companies that screen varieties for SCN resistance have indicated if the variety has known susceptibility or resistance:

- R – Resistant
- MR – Moderately Resistant
- S – Susceptible
- MS – Moderately Susceptible

These notations followed by a number indicate the identified cyst nematode race. The source of resistance was mostly PI88788 with some Peking and PI89722. Sources are found in parenthesis after the variety name in the variety list table.

## SELECTING A VARIETY

Some of the varieties in the conventional trials have special traits such as a specific oil profile, which growers can sell for premium prices. Talk to the seed dealer about premium varieties. Seed dealers and their contact information are listed in the 'Index of Varieties and the 'Directory of Companies'.

LSD (least significant difference, found at the bottom of each data column) values are useful when comparing two varieties in the same table. If the difference between two varieties is less than the LSD value, this difference is probably due to chance or minor environmental differences. However, if the difference between two varieties is greater than the LSD, there is a 95% or greater probability that the difference in performance is due to the greater yield potential of one variety. Valid comparisons can only be made between averages in the same column. The C.V. (coefficient of variation, found at the bottom of each data column) is indicative of the trial precision. Lower C.V. values indicate more precise trials.

The primary consideration in selecting a variety is yield. When evaluating a variety, consider yield performance over locations and across several years, if available. Considerations other than yield are also important in selecting a variety. It is especially important to select a variety that will mature before the first frost in the fall.

The degree of lodging varies among varieties. Lodging ratings should be used to evaluate potential harvest losses. Growers who have experienced lodging in the past and have had harvest problems may want to select a more lodging-resistant variety. Alternatively, a variety susceptible to lodging may be planted at a slightly lower population to increase standability.

Growers should note seed size when selecting planting rates. Planting rates should be based on number of seeds per acre and not on pounds per acre. It often benefits growers to select a few good varieties for planting each year. Yield determination and careful field evaluation during the growing season will add to the grower's knowledge of variety performance and allow for better selection.

## HERBICIDE TRAITS

The column in the chart labeled HERB contains the variety herbicide resistance.

- Conv=conventional
- LL=Liberty Link
- RR1=Roundup Ready
- RR2X=Roundup Ready 2 Extend
- XF=Extend Flex
- E3=Enlist E3
- GT27=Glyphosate Tolerant
- LLGT27=Liberty Link and Glyphosate Tolerant

## SEED TREATMENT

Treated soybean seed submitted for Michigan State University's Soybean Performance Trials are noted by abbreviation in the 'TMT' column. Questions concerning treatments should be directed to the seed company. Contact information can be found in the 'Directory of Companies'.

| Code | Treatment |
|---|---|
| ACL | Acceleron-Insecticide |
| AA Elite | Ag Armour Elite |
| AG-MX | Agri Max |
| CM | Cruiser Maxx-Insecticide |
| CM+VIB | Cruiser Maxx + Vibrance Insecticide/Fungicide |
| DFender | Defender-Fungicide |
| ECL-Trio | Eclipse Trio-Fungicide |
| Ecl-US-Q | EclipseUS quad IM-Fungicide |
| EG | EverGolEnergy-Fungicide |
| Encase | Encase-Root growth |
| EQ-VIP | Equity VIP-Insecticide/Fungicide |
| G | Gaucho-Insecticide |
| I | ILeVO (BayerCropScience) Nematicide |
| N-H | Inhibit |
| Lum | Lumisena-Fungicide |
| N | NForce-Nitrogen Fixing Bacterium |
| OBV | Obvius Plus-Fungicide |
| P | Poncho-Insecticide/Nematicide |
| Radius | Radius Premium-Herbicide |
| SA | Saltro-Nematicide |
| Titan | Titan-Insecticide |
| UT | Untreated |
| Vib | Vibrance Maxx-Fungicide |
| V | Votivo-Insecticide/Nematicide |