MISSISSIPPI SOYBEAN PROMOTION BOARD
PROJECT NO. 36-2015 (CONT)
2015 ANNUAL REPORT

Title: 2015 Soybean Management by Application of Research and Technology (SMART)

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BACKGROUND AND OBJECTIVES

The SMART program coordinated by the Mississippi State University Extension Service and supported by the Mississippi Soybean Promotion Board is designed to assist with implementing best management practices and technologies into the farm level. In doing so, the latest research-proven practices can be demonstrated on the farm scale to assist with improving soybean yield and ultimately, profitability.

Soybean is an integral component of Mississippi's agriculture production systems. Currently, soybean is third on the list of Mississippi's agricultural commodities. Approximately 2.3 million acres of soybeans were harvested in Mississippi in 2015 with an average yield of 46 bushels per acre. Soybean productivity has increased over the last 20 years due to a multitude of reasons, including but not limited to improved management, technology, and seed options. However, potential for improvement of our production systems still remains.

During the 2015 production season, the SMART program consisted of demonstration and training events that promoted ideal practices to Mississippi's soybean producers. This portion of the program is intended to provide soybean growers, crop consultants, and other agriculture professionals with the latest information to assist throughout the growing season.

REPORT OF PROGRESS/ACTIVITY

Objective 1: To identify and apply key management practices which can increase profitability in soybean production.

Decisions about variety selection, management for nutrients, iron deficiency chlorosis (IDC), nematode pests, irrigation, and diseases are things that Mississippi soybean producers face each year. Management practices to address these and other issues are important for soybean production to remain successful. In 2015, demonstration locations designed to address these management practices were established in various locations around Mississippi.

Objective 2: Provide a hands-on educational opportunity for utilizing profitable technologies and the latest results on soybean research.

During 2015, 18 soybean variety demonstration locations were harvested across Mississippi with participation by MSU-ES county and area agents. Soybean varieties planted at each location were selected to be a part of a specific set suitable for the region where the demonstration was located. Specifically, a total of 15 varieties were included in Roundup Ready (RR) MG IV sets, 14 varieties in RR MG V sets, 7 varieties in LibertyLink (LL) MG IV sets, and 5 varieties in LL MG V sets. Of the 18 locations harvested, the variety demonstrations include:

- 6 irrigated RR MG IV locations
- 3 irrigated RR MG V locations
- 2 non-irrigated RR MG IV locations
- 3 non-irrigated RR MG V locations
- 1 irrigated LL MG IV location
- 1 irrigated LL MG V location
- 1 non-irrigated LL MG IV location
- 1 non-irrigated LL MG V location

These locations successfully covered targeted regions of the Mississippi Delta, the Mississippi Prairies (Black Prairie and/or Jackson Prairie), Mississippi Coastal Plains, and the Mississippi Valley Silty Uplands. These locations also represented 3 different row spacings, 2 tillage systems, 14 soil series, and irrigated and non-irrigated systems, with planting dates ranging through 6 weeks. This information is summarized in the 2015 MSU-ES Soybean Variety Demonstration Program Results publication. Beyond this publication, the variety demonstration results were used to supplement data from small plot variety testing to develop the MSU-ES Variety Suggestions for 2016 publication. These fields provided Extension personnel the ability to host producers for local demonstrations in a number of locations as well.

In addition, 3 nematode demonstration fields, 3 fungicide demonstration fields, 2 irrigation sensor demonstration fields, and 1 IDC variety tolerance evaluation set containing 42 different varieties were demonstrated in 2015.

Objective 3: Collect long-term data that can be used to determine specific management programs which can offer increased soybean yields and profits.

During the 2015 season, all variety demonstration locations were monitored closely to distinguish differences among varieties. In the early season, crop vigor and emergence ratings were recorded. Disease tolerance was visually rated and final plant height was measured at each location for each variety. Once the plots had reached maturity, green stem, lodging, and shatter ratings were recorded before harvest was conducted. These data were used in conjunction with harvested yield data for comparisons between varieties. Significant differences were seen in height, lodging, and yield when comparing varieties, and data are provided in detail in the MSU-ES On-Farm Soybean Variety Demonstration Program publication.

Soybean yield was collected at all demonstrations of fungicide applications and nematicide seed treatments, while plant height and IDC varietal tolerance scores were evaluated at the IDC location. These data are provided in detail in the graphics/table section.

Objective 4: Promote profitable and sustainable practices that will benefit current and future Mississippi soybean producers.

Many factors were evaluated for the promotion of profitable and sustainable practices in Mississippi soybean production. A total of 27 locations were implemented in 2015 for demonstration of various soybean management practices. These demonstrations and the data generated through them provided opportunities for promoting best management practices through hands-on learning, field days, short courses, turn row talks, grower meetings, Extension

publications, and online materials. The use of demonstration programs and related events will allow the promotion of these ideal practices to be known to Mississippi's soybean producers.

IMPACTS AND BENEFITS TO MISSISSIPPI SOYBEAN PRODUCERS

This program has the ability to impact every soybean producer in the state of Mississippi by effectively demonstrating proven management practices so that producers are able to observe differences firsthand. Not only does the data provide potential benefits through observations on yield, but other crop factors or questions growers often ask can be addressed through these large plot demonstrations.

END PRODUCTS

MSU-ES On-Farm Soybean Variety Demonstration Program publication
MSU-ES Variety Suggestions – Short List

2015 MSU-ES Fungicide Demo

Purpose: These demonstration fields were designed to evaluate the effect of a foliar fungicide application on soybean yield during the 2015 growing season.

Procedure: A single application of Quadris (4 fl oz/A), Quadris (6 fl oz/A), Quadris + Topsin (4 + 10 fl oz/A), Quadris Top (8 fl oz/A), or Priaxor D (8 fl oz/A) was applied in large, field scale plots at the R3/R4 application timing. All fungicide treatments were compared to an untreated control or producer standard. This trial was conducted at 3 locations in Mississippi in 2015. These locations were planted across 3 planting dates. The locations and plantings dates consisted of the following: Washington County planted in April, Tunica County planted in May, and Prentiss County planted in June. Irrigated locations included Washington and Tunica County, while the Prentiss County location was non-irrigated. Soybean yield was measured in bushels per acre.

Results: All fungicide applications produced higher soybean yields than the comparison treatment, with the exception of both Quadris rates applied at the Tunica County location. The greatest average yield gain was found to be where a single foliar application of Priaxor D (8 fl oz/A) was applied, resulting in a 5.9 bushels per acre increase.

Table 1: Soybean yield following fungicide application at R3 growth stage on soybean planted in April, May, and June.

Location	Irrigation Method and Planting Date	Comparison Treatment	Quadris 4 fl oz/A	Quadris 6 fl oz/A	Quadris + Topsin 4 + 10 fl oz/A	Quadris Top 8 fl oz/A	Priaxor D 8 fl oz/A
		Yield (bu/ac)					
Washington Co.	Irrigated – April Planted	67.1[1]	70.5	73.3	74.0	71.5	73.4
Tunica Co.	Irrigated – May Planted	51.4[2]	50.1	49.3	51.9	53.6	53.0
Prentiss Co.	Non-irrigated – June Planted	17.7[1]	25.5	23.4	24.8	28.1	27.6
AVERAGE		45.4	48.7	48.7	50.2	51.1	51.3

[1] – Comparison treatment = untreated
[2] – Comparison treatment = Quadris + Tebuconazole 6 + 4 fl oz/A

2015 MSU-ES Nematode Demo

Purpose: These demonstration fields were designed to evaluate the effect of a nematicide seed treatment on soybean yield.

Procedure: Two seeds treatments, Clariva Complete Beans and CrusierMaxx Vibrance Beans, were applied to a soybean variety with tolerance to certain nematode species (NK S55-Q3) in 3 locations across Mississippi in 2015. Locations included soybean fields in Benton, Prentiss, and Union Counties. Nematode samples collected from the demonstration fields in Benton and Prentiss counties indicated above established threshold levels of soybean cyst nematodes present at the time of planting. Yield was collected in order to determine the effectiveness of each seed treatment.

Results: Soybean yield response was variable. At the two locations with known, above-threshold levels of soybean cyst nematode, soybean yield was equal (39.3 vs 39.4) to 3.2 bushels higher (33.9 vs 30.7) when the nematicide seed treatment was included. At the site with little to no presence of soybean cyst nematode, no benefit was found with the addition of the nematicide seed treatment. Additional sites will be evaluated in 2016 to further investigate soybean yield response to these seed treatments.

Table 2: Soybean yield response to nematicide seed treatment

Location	Clariva Complete Beans	CruiserMaxx Vibrance Beans
	Yield (bu/ac)	
Benton Co.	39.3	39.4
Prentiss Co.	33.9	30.7
Union Co.	53.0	57.1
Average	42.0	42.4

2015 MSU-ES Iron Deficiency Chlorosis (IDC) Variety Screening Demo

Purpose: The purpose of this demonstration was to evaluate soybean varieties for susceptibility/tolerance to iron deficiency chlorosis (IDC).

Procedure: During 2015, 42 commercial, maturity group V soybean varieties were planted on June 15 at a single location in Monroe County. Data collected on these varieties consisted of final plant height and IDC tolerance ratings. IDC ratings were based on a 0 - 5 scale, with 0 being completely tolerant and 5 being completely susceptible.

Results: No variety was completely tolerant to IDC. The following table contains the final plant height (inches) and the IDC tolerance score based on visual observations of each variety.

Table 3: Soybean variety response to IDC

Variety	Plant Height (in)	IDC Rating (Scale 0 to 5)[1]	Variety	Plant Height (in)	IDC Rating (Scale 0 to 5)[1]
Asgrow AG5233	39	2	Great Heart Seed GH-516CR2	26	3
Asgrow AG5332	26	3	Mycogen 5N501R2	24	3
Asgrow AG5335	22	4	Mycogen 5N522R2	26	4
Asgrow AG5533	21	3	Mycogen 5N550R2	22	4
Asgrow AG5535	18	3	NK S50-J7	22	3
Armor 50-R21	25	4	NK S52-Y2	24	4
Armor 51-R50	21	3	NK S55-Q3	29	3
Croplan R2C5081	28	4	Progeny P 5213 RY	25	3
Delta Grow DG 5625R2Y	23	3	Progeny P 5226 RYS	23	3
Delta Grow DG 5170R2Y	28	4	Progeny P 5333 RY	24	3
Delta Grow DG 5230R2Y	18	3	Progeny P 5555 RY	26	2
Delta Grow DG 5575R2Y	31	3	Progeny P 5610 RY	28	4
Delta Grow DG 5625R2Y	35	3	Schillinger 5220.RC	25	3
Dyna-Gro S52RY75	25	5	Terral REV 51A56	18	3
Delta Grow DG 5575R2Y	32	2	Terral REV 52A94	25	3
Dyna-Gro S56RY84	31	2	Terral REV 54R84	23	3
Dyna-Gro 92RY55	33	3	Terral REV 55R53	27	3
Dyna-Gro S52RY75	30	5	Terral REV 55R63	22	4
Dyna-Gro S56RY84	31	5	Terral REV 55R63	20	3
Dyna-Gro 92RY55	22	4	Univ. of Ark. UA 5414RR	26	3
Dyna-Gro S56RY84	27	3	USG 75J45R	27	4

[1] – IDC tolerance ratings scored on a 0 to 5 scale with 0 being completely tolerant and 5 being completely susceptible