

Evaluating Suboptimal Soybean Stands

Planting into a poor seedbed, planter adjustment problems, poor quality seed, soil crusting, inadequate or excessive soil moisture, seedling diseases, and numerous environmental issues can contribute to less than ideal soybean stands. Soybean replant decisions can be difficult for consultants and growers to make. Furthermore, the soybean plant can physiologically adjust to the adjacent plants in the field by adding branches, pods per plant, seeds per pod, and an increasing seed size. For a second year, the Scott Learning Center evaluated suboptimal soybean stands in order to better understand the criteria for replanting.

Study Guidelines

A demonstration trial was conducted at the Monsanto Learning Center in Scott, Mississippi to evaluate the effects of reduced plant population on soybean yield. This was the second year of a study initiated in 2010 at the Scott Learning Center.

Twin rows were planted 7.5 inches apart on a 38-inch bed with a Monosem® Twin-Row planter. Different soybean stand regimes were implemented in order to compare a “normal” stand with reduced plant populations, skip stands, replanting into an existing stand, and replanting a new stand (Table 1). Special modifications were made to the planter plates to allow the planting of skippy stands.

Table 1. Description of the nine soybean stands evaluated in this study.

Treatment	Soybean Stand
1	140,000 Planted
2	85,000 Uniformly planted
3	85,000 w/ 12-inch skips
4	85,000 w/ 24-inch skips
5	65,000 Uniformly planted
6	65,000 w/ 12-inch skips
7	65,000 w/ 24-inch skips
8	Plant 65,000 into 65,000 planted
9	65,000 killed and replanted @ 140,000

Twelve-inch and 24-inch skips were randomly inserted across selected plots. Prior to planting, populations were calculated using the skips as a variable to result in the end target population. The number of skips increased as final plant population decreased.

Maturity Group IV and Group V soybean products, Asgrow® AG4531 brand and AG5606 brand, were planted on May 2, 2011. The replanting date was May 19, 2011. Weeds were controlled with a preemergence (PRE) application of Warrant® Herbicide at 40 oz/acre plus Sencor® herbicide at 0.33 lbs/acre, and if needed, Roundup WeatherMAX® herbicide at 22 oz/

acre behind the planter. Postemergence weed management consisted of a layby application of PARRLAY® herbicide at 16 oz/acre plus Roundup WeatherMAX herbicide at 22 oz/acre. Trials were furrow irrigated as needed. All plots were harvested on October 10, 2011.

Results and Conclusions

Previous research has indicated that skips of less than 2 feet generally have little effect on soybean yield¹. Areas where skips from 2 to 3 feet were observed may result in a yield reduction up to 13%¹.

No differences were seen between maturity groups when data was combined. Results from this research support the observation that soybeans have a tremendous ability to compensate for missing plants (Figure 1). The yield range among the nine soybean stands was only 5 bu/acre, with a high of 44 bu/acre and a low of 39 bu/acre. Results from 2010 showed the average yield across varieties and planting dates differed by only 7 bu/acre, with high and low yields of 71 and 64 bu/acre, respectively². The 2011 data once again confirms that a producer can expect to achieve favorable yields with a plant population down to 65,000 if the planting skips are 2 feet or less in length down the row.

Very little yield difference was observed when comparing yield data from a “normal stand” of 140,000 planted (43 bu/acre), a reduced stand of 65,000 uniformly planted (42 bu/acre), planting 65,000 into 65,000 (44 bu/acre), and destroying a 65,000 stand to replant 140,000 (39 bu/acre). Replanting 65,000 into a 65,000 stand resulted in only a slight increase in yield (2 bu/acre) over the left-alone 65,000 stand (Figure 1). A reduction in yield was observed when a low plant population was killed and replanted. As a general rule, lower yield potential can be expected with later planting dates.

Previous university research concluded that there is no yield advantage to filling in thin stands (66,000 or greater plants/acre) with rowed beans³. Reasons for this response include the potential damage the second planting can cause to the original thin stand. Additionally, the yield potential of the second planting is lower because of the later planting date and competition from the original stand.

to pg. 2 

Evaluating Suboptimal Soybean Stands

▶ from previous page

References

¹Purdue University Pest & Crop Newsletter. Issue 11. May 28, 2004. Online at <http://extension.entm.purdue.edu>

²Scott Learning Center Summary, Evaluating suboptimal soybean stands, 2010.

³Semmel, T, EP Christmas, and GC Marini. An evaluation of supplemental

planting to increase marginal stands of narrow row soybean using a 30 inch planter. (American Society of Agronomy, Annual meetings, 10-14 Nov. 2002. Indianapolis, IN). Agronomy Abstracts 2002.

Additional reference used in the development of this publication: Robinson, AP and SP Conley. Thin soybean stands: should I replant, fill in, or leave them alone? Purdue University Extension. SPS-1040-W. Nov 2007.

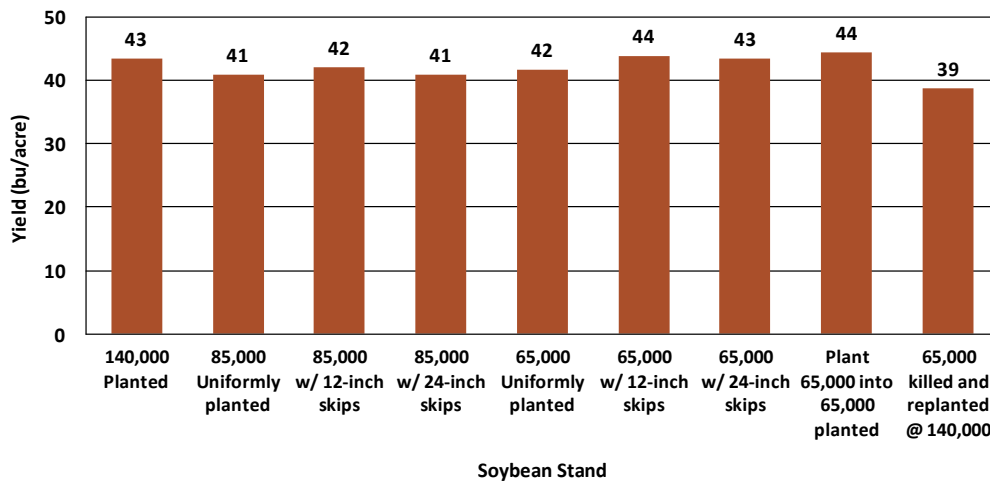


Figure 1. Effect of soybean stand on yield. Results averaged across maturity groups. Data Source: Scott Learning Center Data, 2011.

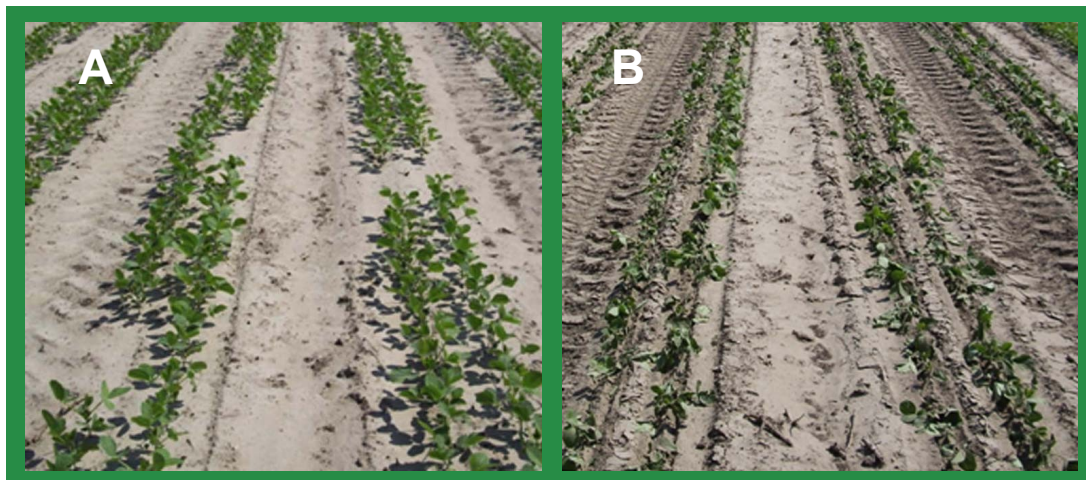


Figure 2. (A) Randomized 12-inch skips and (B) Replanting 65,000 into 65,000.

The information discussed in this report is from a single site, non-replicated, one-year demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

For more information regarding the intellectual property protection for the seed products identified in this publication, please see www.asgrowanddekab.com. Roundup Technology® includes Monsanto's glyphosate-based herbicide technologies. Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Warrant® Herbicide is not registered in all states. Warrant® Herbicide may be subject to use restrictions in some states. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local Monsanto dealer or representative for the product registration status in your state. Tank mixtures: The applicable labeling for each product must be in the possession of the user at the time of application. Follow applicable use instructions, including application rates, precautions and restrictions of each product used in the tank mixture. Monsanto has not tested all tank mix product formulations for compatibility or performance other than specifically listed by brand name. Always predetermine the compatibility of tank mixtures by mixing small proportional quantities in advance.

Asgrow and the A Design®, Asgrow®, PARRLAY®, Roundup Technology®, Roundup WeatherMAX®, Roundup®, Technology Development by Monsanto and Design®, and Warrant® are trademarks of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2012 Monsanto Company. ABT011012