

2010 Demonstration Report



THE LEARNING CENTER

at Scott, Mississippi

Evaluating Suboptimal Soybean Stands

Soybean replanting is a challenging decision that is typically faced by growers every year in the Mid South. The soybean plant is very resilient and can adjust to the final stand remaining in the field by adding branches, more pods per plant, seeds per pod, and an increase in seed size. It is this ability of the soybean plant to compensate that makes the replant decision difficult. Careful evaluation of plant stands can assist in the decision to replant suboptimal soybean stands.

Study Guidelines

A demonstration trial was conducted at the Monsanto Learning Center in Scott, MS in 2010 to evaluate the effects of reduced plant population on soybean yield. A twin-row Monosem® planter was used to plant the trial. The target plant populations evaluated were 130,000; 100,000; 85,000; and 65,000 plants/acre. The check population of 130,000 plants/acre was planted without skips for data comparison. Special modifications were made to three sets of the planter plates to make the planter plant “skippy” stands. One-foot skips were inserted across the plots (Figure 1). 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.

Two Asgrow® Brand soybean varieties and three planting dates were selected for this trial. All other agronomic practices were kept constant among plots.



Figure 1. Example of multiple one-foot skips within a soybean plot. Skips were created to establish a target plant population.

Results and Discussion

In most situations, stand reduction occurs in two patterns: not uniform across the field, or gaps within the row. Gaps of less than 2 feet in diameter can be compensated for by adjacent soybean plants, which fill in the gaps by developing branches. These branches develop pods and seed that compensate for seed production lost by the reduced stand. In soybean, it is important to remember that unless very wide skips in rows are observed, plants have a tremendous ability to compensate for missing plants. Skips of less than 2 feet generally have little effect on yield potential.¹ Areas where skips from 2 to 3 feet are observed may result in 6 to 13% yield reduction (Table 1).

Table 1. Effect of reduced stand on soybean yield.

Plant Spacing	Yield as a % of Normal
2-ft skips—50% of row	94
3-ft skips—50% of row	87
4-ft skips—50% of row	85

Source: Purdue University Pest & Crop Newsletter: Issue 11 May 28, 2004.

Results from this trial show the average yield across varieties and planting dates differed by only 7 bushels/acre (Figure 2). Soybeans compensate for low stands and are able to produce yields that differ only slightly across a wide range of

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populations. A soybean stand with the potential to yield 90 percent or more of optimum should be saved and not replanted because the costs associated with replanting are likely greater than the return from replanting.²

A uniform stand of 100,000 to 130,000 plants/acre is recommended.³ However, Mississippi State University has observed little to no yield reduction for plant populations as low as 75,000 plants/acre.³ Seeding rates which allow a plant population this low to be obtained are not recommended, but this information is helpful when making the decision to replant or keep a soybean stand in question.

Sources:

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

² Whigham, K. et al. Soybean replant decisions. PM 1851. June 2000. Iowa State University Extension. Online at <http://www.extension.iastate.edu>

³ Koger, T. Soybean agronomics. Mississippi Crop Situation 2010. May 7, 2010. Number 5. Mississippi State University Extension. Online at <http://agfax.com>

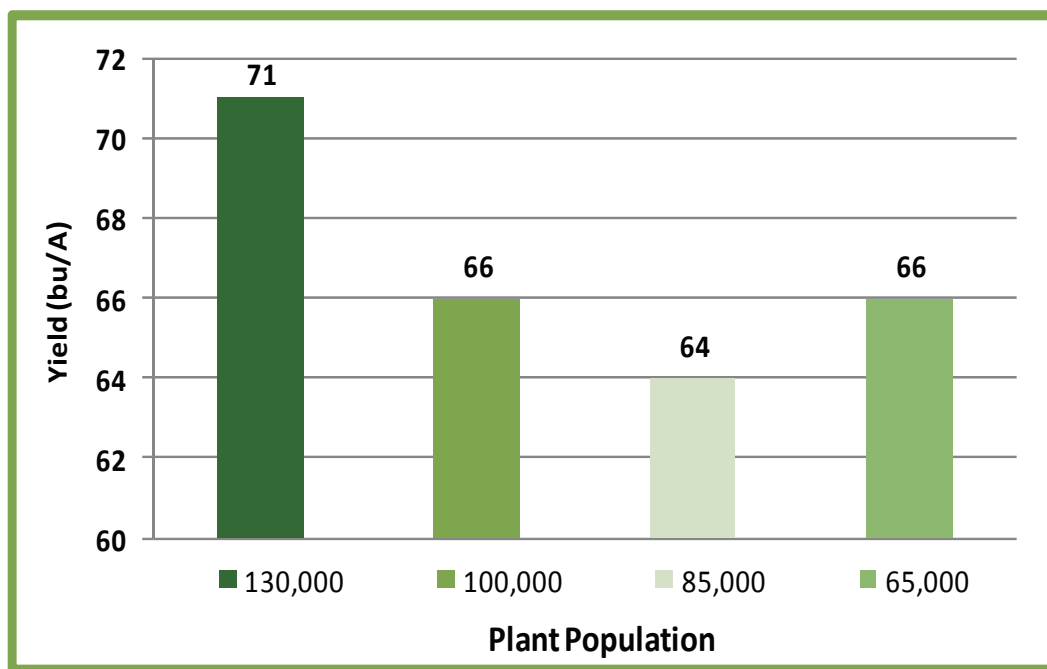


Figure 2. Soybean yield results by final plant population (plants/acre). Results averaged across soybean varieties and planting dates.

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.

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.

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