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Soybean planting date impact on yield in organic systems

Written by Sarah Carlson and Amber Anderson

Abstract

Organic production typically delays planting of soybean (Glycine max) until late May. However, a longer season provides time needed to reach maximum yield potential. In 2011, planting dates in mid-May resulted in yields five bushels per acre higher than those soybeans planted two weeks later.

Cooperator

Ron Rosmann, Harlan

Project Timeline

January 2011 to December 2011

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Web Link

http://tinyurl.com/plantingdate

Funding

Leopold Center for Sustainable Agriculture On-Farm Research and Demonstration Program

About the Cooperator

Ron Rosmann, Rosmann Family Farms, has been pesticide-free since 1983 and certified-organic since the 1990s. The family grows and markets diverse crops including corn, soybeans, barley, oats, popcorn and alfalfa. Integrated into the organic-farming system are a 40-sow, deep-bedded, farrow-to-finish operation and a 90-head, cow-calf herd.

Ron Rosmann (above, far right) talks to field day participants about his soybean planting date and other research projects on his family-run farm near Harlan.

Background

Planting date in Iowa is subject to the unpredictable weather conditions that occur. Later planting has been used to avoid some of these hazards such as a late spring frost, soil crusting or fungal diseases that are more prevalent in cold, wet conditions (Pedersen). In organic production, a benefit to delayed planting may be increased weed-control opportunities. A reduced growing period must be balanced against these potential benefits. A longer growing period favors yield increases as the plant continues to grow, flower and set seed. If the growing season is shortened by both a late planting date and an early frost, significant loss of yield could result.

Method

To determine the impact of planting date on soybean yield, three planting dates were used beginning in mid-may and subsequently planted every week. The yields from each plot were then compared. Each planting date consisted of six replications randomized across the field. The soybean variety selected for this trial was Blue River Hybrid's 2A7 that sold for $37/bag in 2011. All plots were harvested October 6, 2011.

Pre-plant field operations consisted of only a stalk chop. Soybeans were planted at a population of 175,000 seeds in 38-inch row spacings with a Buffalo planter. After planting, weed control consisted of two passes with a rotary hoe and three cultivations. This field is well established in organic production, in a ridge-till system, and consists of 0-5% slopes of Marshall silt-loam.

Hail received August 18 was estimated to have decreased yield by at least 30%. Yield is reported standardized to 13% moisture. Yield statistics were analyzed with JMP 9 software using the Tukey-Kramer method to compare means.

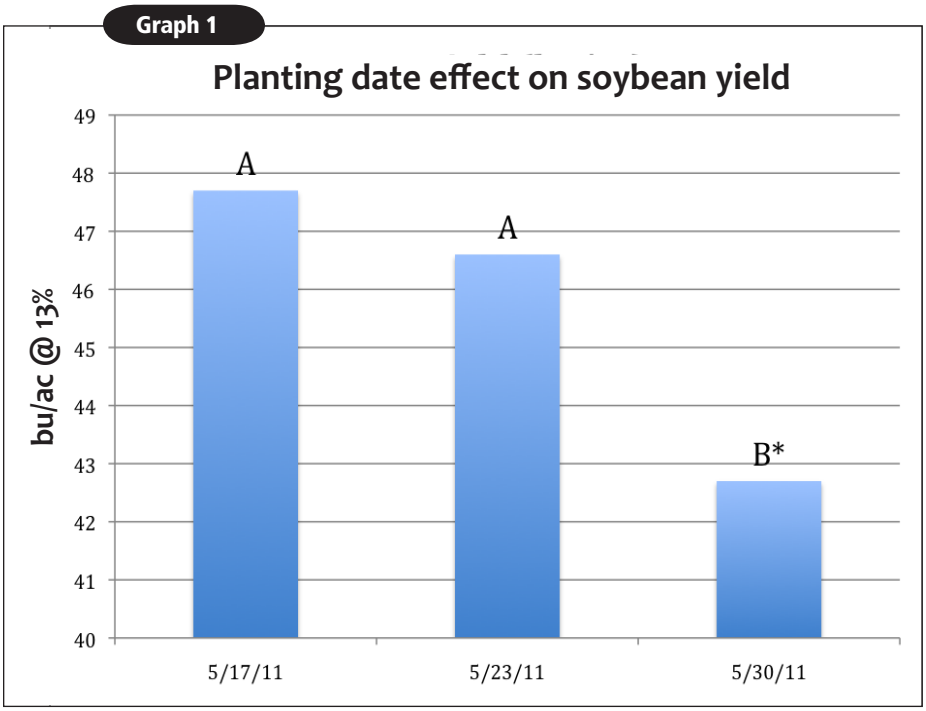
Results and Discussion

*Planting date had a significant effect on yield in this trial (**Graph 1**). Mean yield ranged from 47.7 bu/ac in the earliest planted soybeans to 42.6 bu/ac average for the latest planted plots. May 17 and 23 planting dates are significantly different from May 30 but are not significantly different from each other at the α=.05 level.*

Conclusions

Based upon 2011 conditions near Harlan, other organic producers might want to reconsider delayed soybean planting. If the seedbed is acceptable, an increase in yield may justify any increased risks associated with an earlier planting date in organic soybean production. Additionally, early frosts at the end of the season would be less detrimental to soybeans that are planted earlier.

Graph 1



** Indicates significant differences in means using Tukey means comparison at an α=.05 level*

References

Pedersen, Pelle. Soybean Planting Date, Accessed 28 December 2011 at http://extension.agron.iastate.edu/soybean/documents/PlantingDate.pdf. Iowa State University, Ames, IA.

(Left to right) Maria Rosmann, Ron Rosmann, Ellen Walsh-Rosmann, Daniel Rosmann and Mark Rosmann, plus farm dog Casey.