On-Farm Evaluation of Twin-Row Corn and Soybean in Southern Minnesota

Lizabeth A.B. Stahl[1*], Jeff A. Coulter[2], and Seth L. Naeve[2]

[1]Worthington Regional Extension Office, Worthington, MN, and [2]University of Minnesota, St. Paul, MN

*Corresponding Author PH: (507) 372-3912; E-mail: stah0012@umn.edu

ABSTRACT

Growers are questioning if crops planted in twin rows, a system where crops are planted in row pairs six to eight inches apart and the center of row pairs are separated by 30 inches, yield greater than crops planted in 30-inch rows. This study was initiated to determine 1) if corn and/or soybean yield could be increased by planting in twin-rows compared to 30-inch rows and 2) if the response to planting population differs in twin rows compared to 30-inch rows. Replicated trials were established by Welcome and Wilmont, MN with two producers who had been planting crops in twin rows for a number of years. Twin rows were compared to 30-inch rows at 3 planting populations in corn (33,000, 38,000, and 43,000 live seeds/ac) and soybean (100,000, 140,000, and 180,000 live seeds/ac). Stand counts were taken after emergence in both crops and again in soybean prior to harvest. Grain yield and moisture were recorded at harvest. Results were analyzed by ANOVA and means separated using Fisher's Protected LSD at the 0.05 and 0.10 significance levels. Row spacing and population had no effect on soybean yield at either site in 2010. Corn yield was greatest in twin-rows at the highest population at the Wilmont site while row spacing had no effect on yield at the Welcome site. This study suggests planting corn in twin-rows can result in a slight yield increase at very high populations, although there was no clear advantage to planting at very high seeding rates

INTRODUCTION

Narrow-row crop production has the potential to increase crop yield and profits. Planting crops in twin-rows is a variation of narrow-rows where the crop is planted in row pairs 6 to 8 inches apart and 30 inches separates the center of row pairs. A major advantage of twin-rows over 15- or 22-inch rows is that no additional major equipment modifications are needed beyond modifications to the planter. Prior to this work there was no published University research on twin-row corn and soybean production in Minnesota. This research will help growers who are considering whether or not to invest in a twin-row planter for corn or soybeans.

OBJECTIVES

This study was initiated to determine 1) if corn and/or soybean yield can be increased by planting in twin-rows compared to 30-inch rows and 2) if the response to planting population differs in twin rows compared to 30-inch rows.

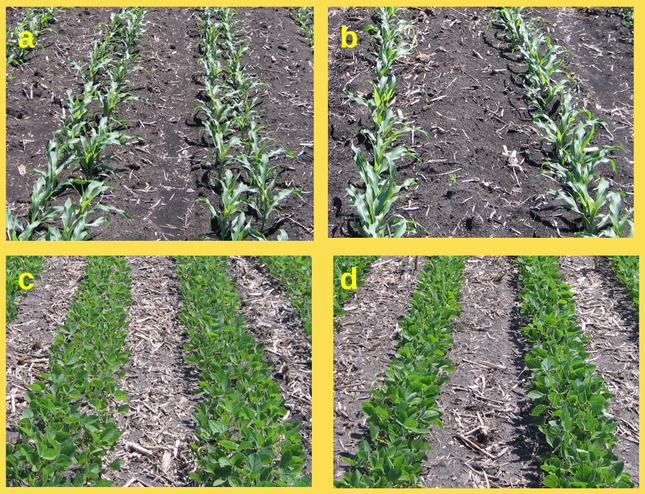

Figure 1: Corn at 38,000 ppa in twin- (a) and 30-inch rows (b) at Wilmont, MN, and soybean at 140,000 ppa in twin- (c) and 30-inch rows (d) at Welcome, MN in 2010.

MATERIALS & METHODS

- Trials in corn and soybean were initiated in 2010 in southern MN with 2 farmer cooperators who have been planting crops in twin rows for several years
- Treatments were arranged in a 2 x 3 factorial experiment in a randomized complete block design with 4 replications at each site. Treatments included two row widths (30-inch rows and 22-/8-inch twin rows) at 3 populations in corn (33,000, 38,000, and 43,000 plants per acre (ppa)) and soybean (100,00, 140,000, and 180,000 ppa).
- The same planter was used for all treatments at a site: One tool bar was switched off for the 30-inch rows. Seeding rates were set by adjusting the planter according to manual recommendations.
- Data collected included stand, moisture, and grain yield for both crops; stalk lodging and test weight for corn; and percent stand loss in soybean.
- ANOVA was used for statistical analysis and means separated using Fisher's protected LSD (α = 0.05).

RESULTS & DISCUSSION

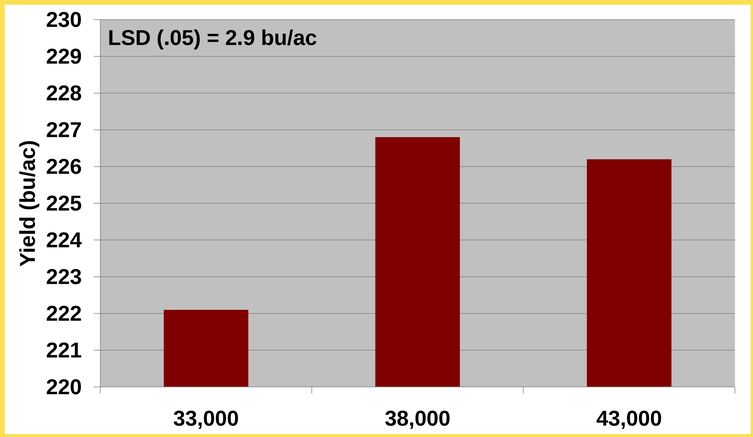

Figure 2: Corn yield as affected by population averaged across row spacing at Welcome in 2010.

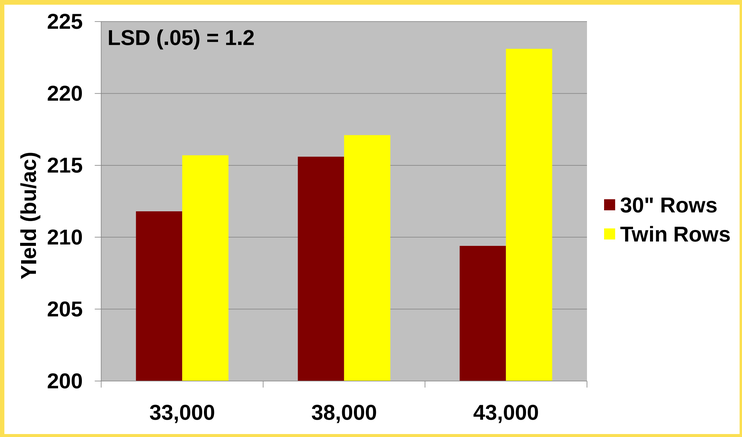

Figure 3: Corn yield as affected by population x row spacing at Wilmont in 2010.

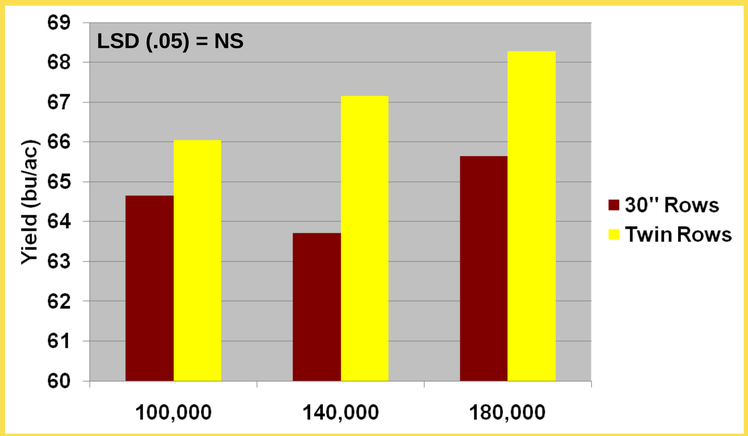

Figure 4: Soybean yield as affected by population x row spacing at Welcome in 2010.

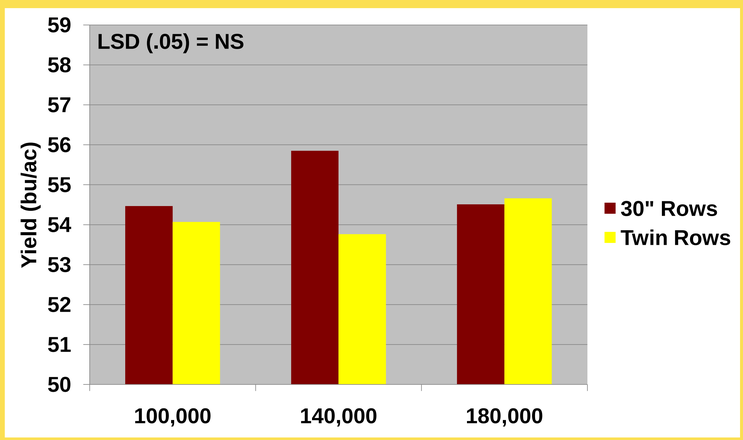

Figure 5: Soybean yield as affected by population x row spacing at Wilmont in 2010.

CONCLUSIONS

- At Welcome, corn yield was maximized at 38,000 ppa. Yield was not affected by row spacing and there was no significant row spacing x population interaction.
- At Wilmont, corn yield was greatest at the highest population in twin rows, while yield was lowest at this population in 30" rows. This indicates the potential for corn to better tolerate higher populations in twin rows than in 30-inch rows, although differences were not consistently seen.
- At both sites, soybean yield was not affected by row spacing or population, and there was no significant interaction between these two factors.
- These trials are being continued in 2011.

ACKNOWLEDGEMENTS

Financial support for this project was provided by the Minnesota Corn Growers Association and the Minnesota Soybean Research and Promotion Council. A special thanks to our farmer cooperators Bryon Kittleson, Richard Penning, John Penning and Brian Penning and also to NuWay Coop in Trimont and the Agronomy Center LLC in Adrian for their assistance with the plots.