



WITH UP-TO-DATE SOYBEAN PRODUCTION INFORMATION

MISSISSIPPI SOYBEAN PROMOTION BOARD
PROJECT NO. 66-2016 (YEAR 1)
2016 Annual Report

Title: On-Farm, Field-Scale Evaluations of Soybean Row Spacings and Seeding Rates

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BACKGROUND

The production of furrow-irrigated soybean on wide (38-40 inch) raised beds is a standard practice in the Mississippi Delta. However, wide beds can delay row-closure and limit light interception necessary for maximum soybean yields if planted in single rows on the beds. This has caused more and more soybean producers to move to twin-row planting patterns.

Twin row soybean production results in faster rates of canopy closure which can improve soybean yield. Twin row planting also results in more equidistant plant arrangement, which can allow for higher seeding rates which may also help increase soybean yield.

Some growers in the Mississippi Delta have moved to narrow row-systems (19-20-inch-wide rows on 76-80-inch-wide beds). Narrow row soybean production promotes even earlier canopy closure and the more equidistant planting pattern may allow for increased seeding rates. The narrow rows and resulting canopy cover can also help to limit growth of troublesome weeds like Palmer amaranth.

However, narrow row production for furrow-irrigated soybean production in the Mississippi Delta has some challenges and opportunities. The creation of wide beds necessary for narrow-row production presents challenges. One of the challenges is irrigation management. In order for the middle rows on wide beds to be thoroughly irrigated, irrigation water needs to move laterally into the bed from the water furrow, meaning narrow-row, wide-bed production is only suitable on cracking clay soils. However, soybean irrigation on wide beds may decrease the time that the soybean root zone is inundated with water, which may help to improve soybean yield and help water get across the field faster, thus decreasing watering time.

OBJECTIVES

Objective 1: Determine the interaction of row spacing and seeding rate for furrow-irrigated soybean production on soybean yield.

Objective 2: Quantify the effects of multiple row spacing and seeding rate combinations on soybean physiological characteristics such as plant stands, light interception, and yield components.

Objective 3: Quantify the effect of furrow irrigation on soybean water status and water use for multiple soybean row spacings.

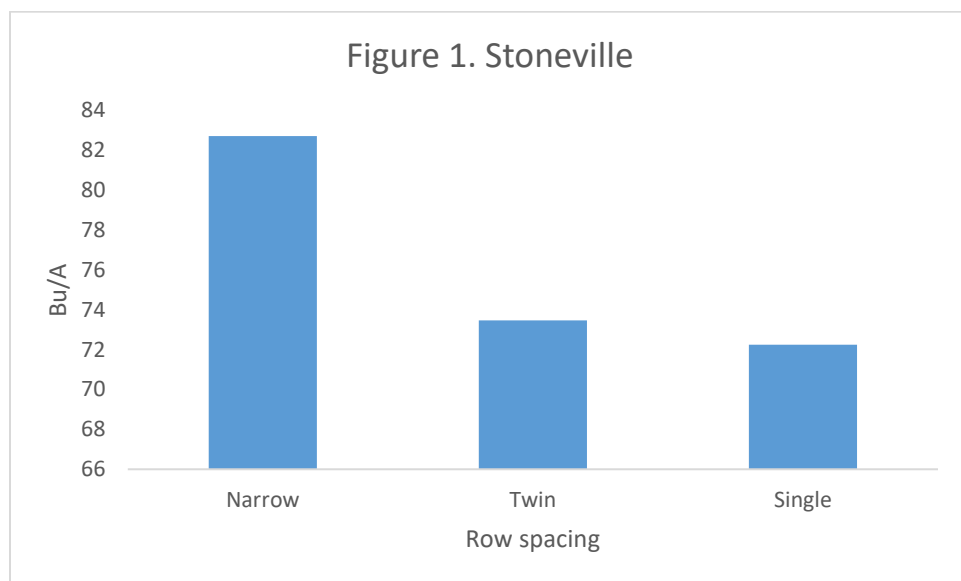
PROGRESS/ACTIVITY

Three study locations were planted in 2016. One study location was lost due to incorrect planting, so we will focus on the two other locations.

The Stoneville location was planted in early April, while the Hollandale location was planted in early May. Planting conditions were optimum at both locations and emergence and stands were very good. No difference in yield was observed between seeding rates at either location. At the Stoneville location (early

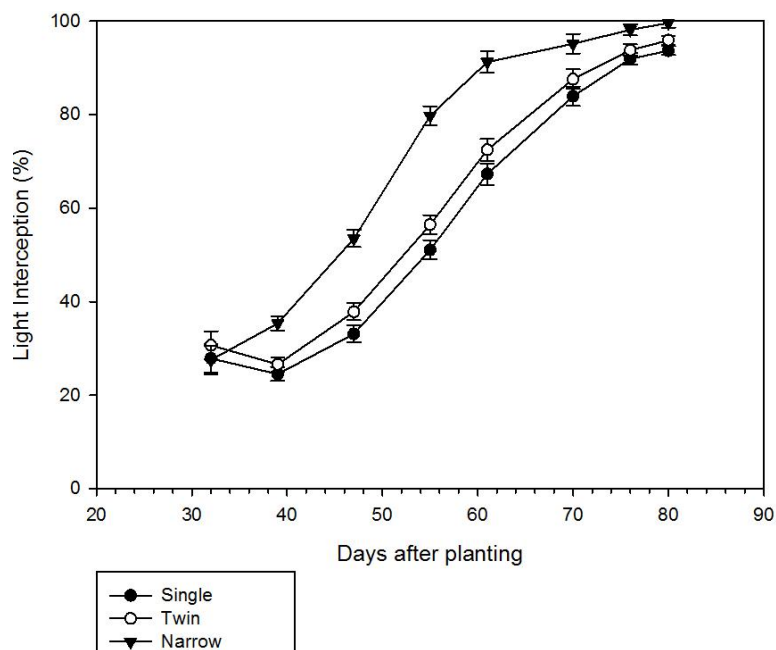
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April planting date), planting in narrow rows (19-in.) resulted in increased soybean yield by 9-10 bu/acre compared to both the twin- and single-row (40-in.) rows (Fig. 1).

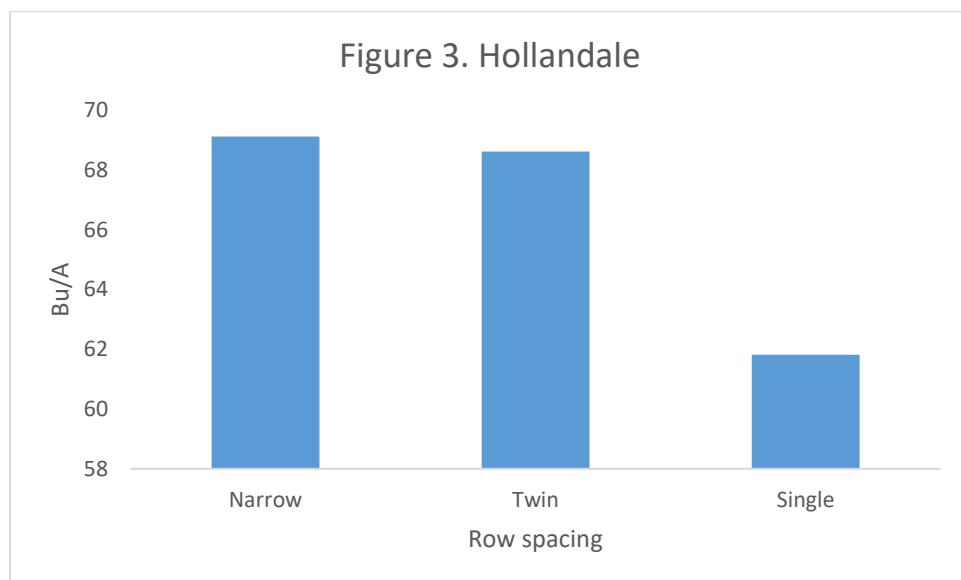


The likely reason for the yield increase was the increased light interception by plants in the narrow rows (Fig. 2).

Figure 2. Light interception for the Stoneville, MS location.

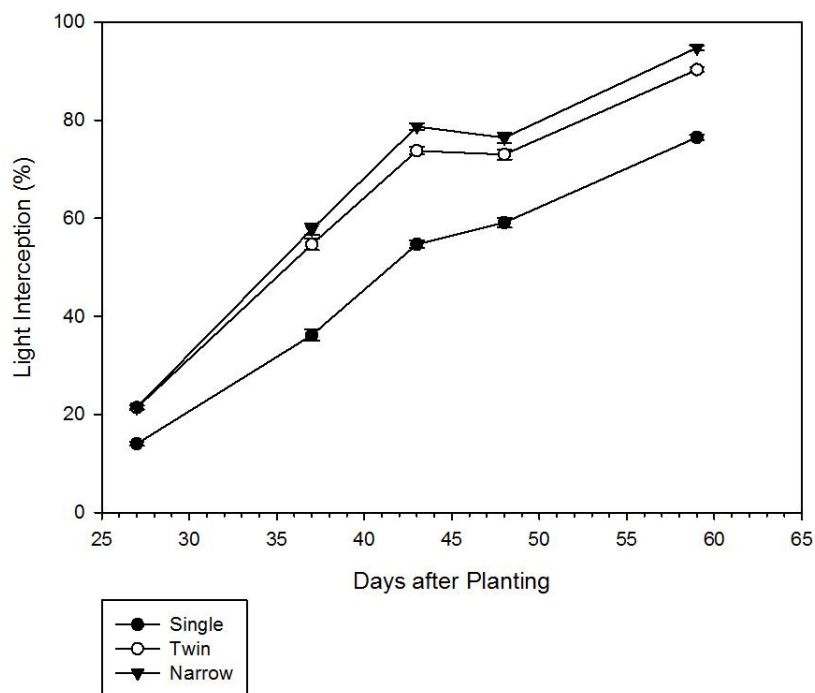


At the Hollandale location (early May planting), yields were similar in the narrow and twin rows (~69 bu/acre). Both the twin and narrow rows yielded 7 bu/acre more than single 40-in.-wide rows (Fig. 3).



Similar to Stoneville, the reason for the yield increase in the Hollandale planting was due to increased light interception for the twin and narrow row spacings (Figure 4).

Figure 4. Light interception at the Hollandale location for different row spacings.



Water use and yield component data are being analyzed and will be available in the final project report.