2010 Demonstration Report

THE LEARNING CENTER

at Scott, Mississippi

Cotton, Corn and Soybean Row Width and Planting Configuration Comparison

Increased production of grain crops in Southern regions has encouraged the evaluation of row patterns and spacing systems compatible with cotton, corn and soybean production. Row crops have traditionally been raised in 38– to 40-inch row spacings to accommodate for farm animal use and hand harvesting. The Midsouthern grower also faces the complication of requiring a bedded production system to facilitate drainage and irrigation. This requirement is one major difference between Midwestern and Midsouth cropping systems. In the Cotton Belt, many producers continue to raise their crops in either 38– or 40-inch rows due to compatibility issues with cotton equipment, drainage and irrigation practices.

Narrow row spacings have been found to increase yield potential in many crops due to better sunlight capture and more uniform spacing of the plants across the field. Cotton or other crops planted in narrow rows will typically canopy earlier in the season, which should increase overall photosynthesis and decrease weed competition. Narrow row crop production may also have the potential to reduce production costs. In most regions, corn and soybean production has transitioned from 40- to 30-inch row widths, which required the development of new varieties/hybrids that are more adapted to the closer row spacing. As with corn and soybeans, certain cotton varieties may be better suited for production in narrow rows.

Utilizing the same row width for cotton, corn and soybeans could reduce the amount of equipment needed and simplify planting and in-season management practices. Some cotton producers in the Midsouth have attempted to raise cotton in narrow rows to promote earliness; however, problems with the system were encountered including, boll rot in wet years, difficulty with equipment, and reduced harvest efficiency.

Study Guidelines

A study was conducted at the Learning Center at Scott, MS to compare the effect of row width and planting configuration on cotton, corn and soybean yield potential. Planting populations were set to accommodate the different row widths and planting patterns in order to achieve a constant planting population in seeds/acre across the different planting/row width configurations.

Cotton—In the study, cotton was planted in 30-inch and 38-inch rows in a 2:1 skip row configuration and in 38-inch rows with no skip (Figure 1). Cotton was planted at 44,000 seeds/acre in all row patterns. Plant growth regulators (PGRs) were carefully evaluated in attempt to maximize cotton production.

Corn—Corn was planted in both 30-inch single rows and 38-inch twin rows utilizing a Monosem® planter at 36,000 seeds/acre for both row widths evaluated.

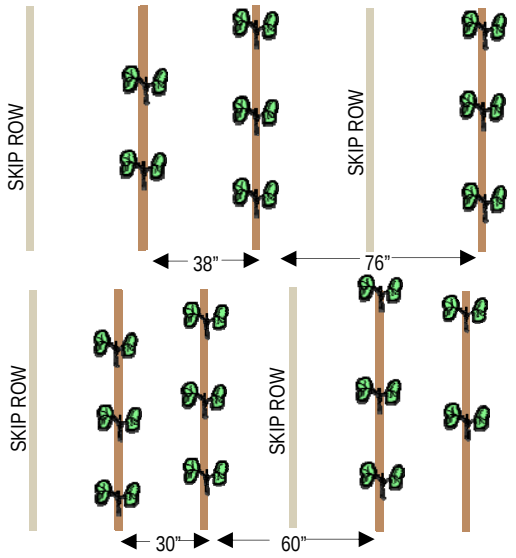

Figure 1. Diagram of planting in 38-inch rows (top) and 30-inch rows (bottom) with 2:1 skip configuration.

Soybean—Soybeans were planted in both 30-inch single rows and 38-inch twin rows utilizing a Monosem planter at 140,000 seeds/acre.

Multiple cotton and soybean varieties and corn hybrids were selected and planted into both the row widths and planting configurations to evaluate the suitability of the systems. The trial was furrow irrigated as needed and fertility and weed control remained consistent for each crop.

Results

Corn - In the corn portion of this trial, all hybrids planted in 38-inch twin rows reported higher yields than the 30-inch single rows (Figure 2). These results contradict much of the earlier row width comparison studies conducted in Northern regions. Evaluation at the

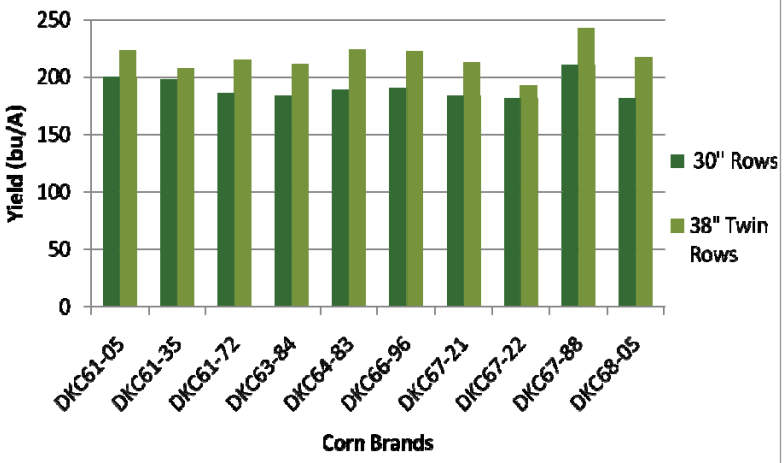

Figure 2. Effect of row width on corn product yield (bu/A).

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Learning Center at Scott, MS will continue to further investigate several possible factors contributing to the lower reported yields during the 2010 growing season. The Learning Center at Scott, MS plans to conduct additional studies on corn population, hybrid adaption, fertility, and irrigation with a concentration on 30-inch row comparisons.

Soybean - A consistent yield response was not seen when comparing between the 30-inch single rows and 38-inch twin rows (Figure 3). Variation in yield response may be partially due to soybean variety adaptation to different row spacings. Certain soybean plant types, such as bushy or narrow, may be better suited for wide or narrow row configurations.

Cotton—Cotton grown in 30-inch 2:1 skip configuration yielded higher than cotton grown in 38-inch 2:1 skip and similar to cotton grown in 38-inch solid row systems (Figure 4). On average across the six varieties, the 30-inch 2:1 skip row system yielded 6 lbs lint/acre more than the 38-inch solid rows and 646 lbs lint/acre more than the 38-inch 2:1 skip row configuration. The 38-inch 2:1 skip row configuration yielded lower than the other planting configurations. One theory behind the lower yield is that the cotton had an unusually high number of fruit set early in the season and plants in the 38-inch 2:1 skip row may have lost the balance between vegetative and reproductive growth resulting in the plant not able to fill the skip spacing, reducing yield potential. The cotton in the 38-inch 2:1 skip rows also matured later than the cotton planted in the other row configurations.

While all cotton varieties selected for the trial appear to yield better in 30-inch 2:1 skip, selection of varieties based on characteristics ideal for narrow row configurations is still very important. Varieties best suited for narrow rows are somewhat unique plant types, which are able to fill the skipped row and still not have unmanageable vegetative growth patterns. In typical skip row systems, PGR use will decrease on average due to the need for this additional vegetative development. More research will be necessary to evaluate reduced PGR rates and timings for narrow row configurations.

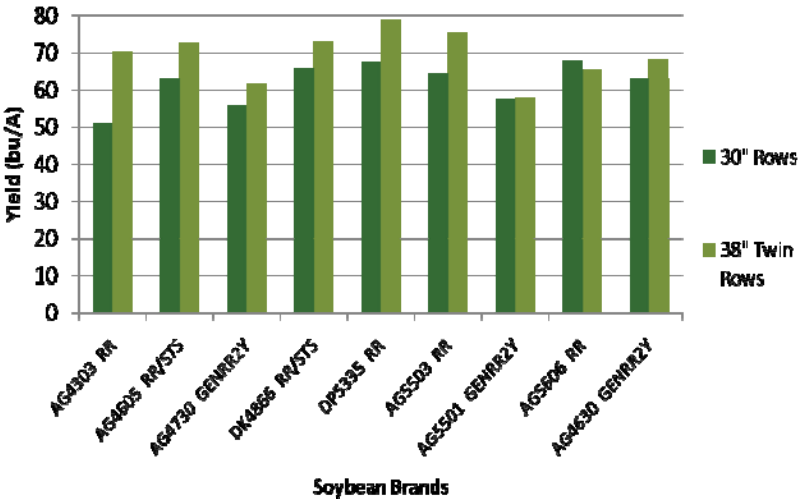

Figure 3. Effect of row width on soybean product yield (bu/A).

RR—Roundup Ready® RR/STS—Roundup Ready®/STS®
GENRR2Y—Genuity® Roundup Ready 2 Yield®

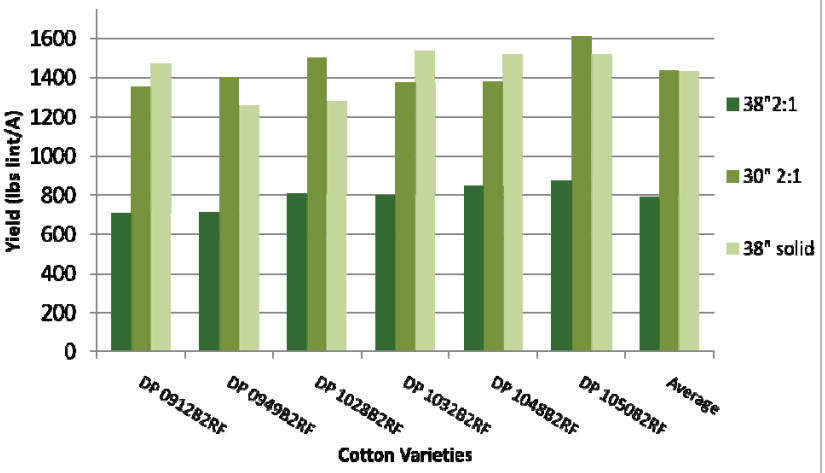

Figure 4. Effect of row width and planting configuration on cotton variety yield (lbs lint/A).

Conclusions

Cotton producers may benefit from several advantages of the 30-inch 2:1 skip configuration. Narrow row widths may allow for lower planting rates (per field acre, not per planted acre), reducing seed and other input costs. Having a crop planted in a skipped row pattern may improve air flow to plants. Improved air flow in and around the plants may moderate plant

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temperatures and increase photosynthesis levels. Finally and most importantly, planting cotton utilizing 30-inch rows would make the crop more compatible with grain crop production.

Numerous studies have reported increased yield for corn and soybeans when grown in narrow row widths; however, many of these studies have been conducted in the Midwest where shorter day corn products and more indeterminate soybean products are planted. The effect of sunlight interception, drainage/irrigation, temperature, nitrogen management and planting populations in Southern regions could alter the yield potential of crops planted in 30-inch rows. More research may be necessary to determine if it is possible to increase corn and soybean yields in 30-inch rows in Southern regions. Many Southern farmers who have made the switch to 30-inch rows have reported yield variability from year-to-year.

During 2011, the Learning Center at Scott, MS plans to continue research to help determine the ideal row width configurations compatible with cotton, corn and soybean production.

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.

Figure 5. Planting twin rows with Monosem® planter.

Sources: Cooke, F.T. et. al. 1996. Cost of producing narrow row cotton in Mississippi. Mississippi Agriculture and Forestry Experiment Station. Bulletin 1056.http://msucares.com (verified 11/15/10)

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