‣ Twin Row And Narrow Row Cotton Production Systems

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Cotton traditionally has been grown in rows spaced 36 to 40 inches. Introduction of a finger stripper harvester in the 1990's fueled interest in stripper cotton production as an alternative to wide row cotton system. Stripper cotton was grown in ultra-narrow rows (7.5 or 10 inch rows) and was never widely adopted for economic reasons (high seed cost and ginning penalties). The recent development of Vari-Row System spindle picker capable of picking 15-inch row cotton has rejuvenated interest in narrow row cotton production. Furthermore, in soybean, studies have shown that planting in twin-row system was more profitable due to higher yield than planting in single-row system. However, in cotton, no research has been done on side-by-side yield comparison of twin-row vs. single-row planting systems. Narrow row cotton can reduce weed control costs by quicker canopy closure. Unlike wide row cotton, cultivation, post-directed herbicide spray, and hooded sprayer applications are not possible in narrow row and twin-row cotton. Roundup Ready Flex cotton varieties offers flexibility to manage weeds effectively using over-the-top applications of glyphosate beyond 4-leaf stage. The objective of this study was to determine weed control benefit, lint yield, and picker harvest efficiency of narrow row (15-inch) and twin-row (10-inch apart rows on 40-inch beds) systems versus that of wide row (40-inch) cotton system under irrigated and non-irrigated environment in the Mississippi delta region.

Field experiments were conducted in 2006 at the USDA-ARS Southern Weed Science Research farm, Stoneville, MS. Roundup Ready Flex (DP164 B2RF) cotton with five plant populations (targeted 30 000, 40 000, 50 000, 60 000, 80 000 plants/A) in 15-inch rows and twin-rows of 10-inch apart on 40-inch beds were compared to a targeted 40 000 plants/A in 40inch rows under irrigated (Dundee silt loam soil) and non-irrigated (Dundee silty clay loam soil) environment. Each plot consisted of 10 rows spaced 15-inch, four sets of twin-rows spaced 10inch apart on a 40-inch center, and 4 rows spaced 40-inch apart. Plots were 50 or 80 feet long. The experiment was conducted in a randomized complete block design with four replications. Cotton was planted on 19 April 2006. Plots were kept weed-free using an herbicide program of cotoran + Dual applied PRE followed by 2 to 3 applications of Roundup applied POST. Cotton was furrow irrigated as needed in the irrigated study. Seed cotton was hand picked from the center two rows of 1-m length at three randomly selected locations in each plot. Number of cotton plants, open bolls per plant, and plant height were recorded at harvest. Seed cotton was ginned and the lint yield was calculated on a land area basis. In 15-inch row, lint yield was corrected for 80% of land area as 2 of 10 rows were skipped to allow equipment traffic. In a third study, 15-inch cotton was harvested using John Deere 9930 picker and 40-inch cotton was harvested using a John Deere 699 picker. Four rows of the 15-inch and two rows of 40-inch from each plot were harvested for yield. There were twelve plots of 100 feet long for each row spacing. After picker harvest, seed cotton was gleaned from the stalks from the entire 100 feet of the harvested rows in each plot. Picker harvest efficiency was calculated as percent of total seed cotton (picker plus gleaned). Seed cotton was ginned and the lint yield was calculated as described above.

Plant population at harvest ranged from 30 000 to 70 000 plants/A in 15-inch row and 36 000 to 88 000 plants/A in twin-row compared to about 50 000 plants/A in 40-inch row under both irrigated and non-irrigated conditions. Plant heights and lint percent were similar among 15-inch, twin-row, and 40-inch row cotton, regardless of irrigation. Lint yields in 15-inch row cotton ranged from 1526 to 1707 lb/A under irrigated and 1155 to 1259 lb/A under non-irrigated condition at 30 000 to 55 000 plants/A density. In twin-row cotton, lint yields ranged from 1513 to 1701 lb/A under irrigated and 1121 to 1425 lb/A under non-irrigated condition at 36 000 to 88 000 plants/A density. Lint yield in wide row cotton was 1485 and 1176 lb/A under irrigated and non-irrigated, respectively. Differences in lint yield were not statistically significant among the three planting systems. Higher plant populations in both 15-inch and twin-row system did not translate to higher lint yield suggesting no yield advantage with high plant density in both systems compared to 40-inch row cotton. Modest increase in lint yield in both 15-inch rows and twin-rows was mainly due to higher number of open bolls produced per plant compared to 40inch rows, regardless of irrigation.

Picker harvest efficiency was slightly lower in 15-inch row (88%) compared to 40-inch row

(93%) cotton and percent lint was similar in both pickers. The 15-inch row system with 27 000 plants/A gave higher lint yield (1491 lb/A) compared to 40-inch row cotton with 50 000 plants/A (1360 lb/A). Plant canopy closed 3 weeks earlier in twin-row cotton and 4 weeks earlier in 15inch row cotton than in 40-inch row cotton with a potential to eliminate at least one Roundup postemergence application.

Results of this one year study indicate that 15-inch row and twin-row planting systems using equal or less plant populations as that of 40-inch row system could produce lint yield equal or higher than 40-inch row system under both irrigated and non-irrigated conditions. It should be stressed that in 15-inch row system, lint yield was corrected for 80% of land area as 2 of 10 rows were skipped under tire tracks. Lint yields will increase as the number of rows planted per trip increase, for example, correction factor will be 90% for 2 of 20 and 93% for 2 of 30 rows skipped. Presently, no picker is available to harvest cotton in 10-inch twin-row system. However, if an adjustable row picker becomes available, twin-row of 15-inch apart on a 40-inch center is a possibility.

Conservation Tillage Strategies For Corn, Sorghum And Cotton

Presented by Charles Stichler
Agronomist, Stichler Agriculture Services

Conservation and reduced tillage continues to change and adaptations made to match the conditions of each producer and the problems encountered. With the shift in weeds and herbicide resistant bio-types beginning to appear in fields, producers must be aware and make hard choices. Rotating herbicides and using combinations to kill adapting weeds, will become more important if producers want to continue using reduces tillage as a viable option. Some limited tillage may be necessary to reduce the dependence on herbicides.

Fertilizer placement and compaction are also issues over a long period. Although crop roots are able to pick up nutrients from a small band – it will be important to move the band to different areas near the planted row. Crops with large root systems such as corn – often respond when roots throughout the soil have access to nutrients.

Stale seed beds in higher rainfall areas and strip tillage in other areas are predominately the most successful reduced tillage practices. Permanent equipment patterns, killing sorghum before harvest when possible and cotton as soon as possible after harvest continue to be important management practices.

Formulas work for “dead” things – but not for living organisms. Farming is “living” in the sense that each year, season and crop with its challenges are different.

Conservation Vs Conventional Tillage, Double Cropping And Cover Crop Effects On Crop Production And Water Use In Subtropical South Texas

Presented by Dr. Bob Wiedenfeld
Professor of Soil Science, Texas Ag. Experiment Station

Water availability for irrigation has become a major concern for South Texas. Conservation tillage offers the advantage of reduced field operations compared to conventional tillage which should result in lower costs, better yields and reduced risk. Water loss is reduced, soil structure improves, and oxidation of organic residues is not as rapid as tillage is reduced. Hopefully this will result more efficient water use as well as lower costs. Water savings due to reduced tillage, however, have thus far not been reported. Double cropping and cover crops offer the potential to increase organic matter accumulation improving soil properties, but will increase initial water requirements. Planting and weed control are major challenges for implementing conservation tillage. The objective of this study is to compare conservation vs conventional tillage, and also to evaluate fall double cropping and cool season cover crops compared to fall fallow under conservation tillage.