CORN PRESENTATIONS

Influence Of Row Configuration, Single Versus Twin-Row, And Cultural Practices On Corn And Grain Sorghum Yield On Mississippi River Alluvial Soils

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Grower interest in narrowing rows less than the standard row widths of 36 to 40 inches for corn and grain sorghum has been lukewarm in the Mid-South; however, interest in this production system has increased in recent years due to the advent of vacuum planters that have the capability of planting twin-rows, 8 to 10 inches apart. On 40-inch wide beds, a common practice is to center twin-rows 9.5-inches apart on 40-inch wide beds, with a 30.5 inch spacing between rows on adjacent beds. Growers can reduce row spacing and, at the same time, have the advantages of raised beds, permitting the use of furrow irrigation. Another advantage is that corn headers do not have to be replaced or modified for this planting system.

Field experiments were conducted in 2005 and 2006 at LSU AgCenter's Northeast Research Station near St. Joseph, LA to evaluate the influence of row configuration, single versus twin-row, and seeding and nitrogen (N) rates on yield of corn and grain sorghum. Corn trials were conducted on Commerce silt loam and grain sorghum trials on Sharkey clay. Twin-rows were centered, 9.5-inches apart, on raised 40inch wide beds. For corn, seeding rates of 25,000, 30,000, 35,000 and 40,000 seed/acre and N rates of 150, 180, 210, and 240 lb/acre were evaluated for each row configuration. Similarly, seeding rates of 6 and 8 seed/ft and 3 and 4 seed/ft for single and twin-rows, respectively, and N rates of 90, 120 and 150 lb/acre were evaluated for grain sorghum. Corn trials were not irrigated. Grain sorghum trials had irrigation treatments using the Arkansas Irrigation Scheduler and a soil moisture deficit of 2.0 inches. Single rows were planted with a JD 7300 planter and twin rows with a Monosem planter. The corn hybrid Dekalb DKC6971 was planted on April 9, 2005 and March 31, 2006. The grain sorghum hybrid Pioneer brand 83G66 was planted on May 17, 2005 and May 19, 2006. Rainfall was 3.0 inches in April, 3.9 inches in May, 0.9 inches in June, 3.6 inches in July and 3.7 inches in August in 2005 and 3.5 inches in April, 5.1 inches in May, 0.4 inches in June, 4.6 inches in July and 4.1 inches in August in 2006. Average minimum temperatures from April to August ranged from 53 to 72°F in 2005 and 57 to 71°F in 2006, while average maximum temperatures ranged from 78 to 97°F in 2005 and 83 to 96°F in 2006. All recommended LSU AgCenter cultural practices were followed in both trials.

There were no statistically significant effect of row configuration, single and twin rows, on corn grain yield in 2005 or 2006 (Tables 1 and 2). Average grain yields were 193.7 bu/acre on single rows and 194.8 bu/acre on twin rows in 2005 (Table 1) and 127.5 bu/acre on single rows and 132.0 bu/acre on twin rows in 2006 (Table 2). Seeding and nitrogen rates affected grain yields similarly for each row configuration. Averaged over row configuration and nitrogen rate treatments, optimum seeding rate was 30,000 seed/acre each year, 31,220 plants/acre in 2005 and 29,240 plants/acre in 2006 (Tables 1 and 2). Averaged over row configuration and seeding rate, optimum nitrogen rate each year was between 180 and 210 lb/acre (Table 3).

For grain sorghum, grain yields were significantly higher for the twin-row configuration in both 2005 and 2006 (Table 4). Grain yields on twin rows compared to single rows were increased 6.6% in 2005 and 5.8% in 2006. Irrigation, seeding rate and nitrogen rate treatments had little affect on grain yield.

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Table 1. Influence of row configuration and seeding rate, averaged over nitrogen rates, on corn grain yield and plant population on Commerce silt loam at the Northeast Research Station, St. Joseph, LA, 2005.

	Grain yield			Plant population		
Seeding rate	Single row	Twin row	Average	Single row	Twin row	Average
seed/acre	---bu/acre---			---plants/acre---		
25,000	189.3	188.9	189.1	26,910	25,100	26,010
30,000	194.4	197.9	196.2	30,080	32,360	31,220
35,000	195.6	195.9	195.8	33,650	34,250	33,950
40,000	195.6	196.5	196.1	38,530	41,350	39,940
Average	193.7	194.8		32,290	33,270	
LSD (0.10):						
Row configuration	NS[1]			NS		
Seeding rate	2.5			720		

[1]NS = non-significant at the 0.10 probability level.

Table 2. Influence of row configuration and seeding rate, averaged over nitrogen rates, on corn grain yield and plant population on Commerce silt loam at the Northeast Research Station, St. Joseph, LA, 2006.

	Grain yield			Plant population		
Seeding rate	Single row	Twin row	Average	Single row	Twin row	Average
seed/acre	---bu/acre---			---plants/acre---		
25,000	126.5	131.3	128.9	26,120	26,410	26,270
30,000	132.7	136.0	134.4	28,910	29,570	29,240
35,000	128.3	131.5	129.9	31,650	32,100	31,880
40,000	122.5	129.0	125.8	32,220	34,990	33,610
Average	127.5	132.0		29,730	30,770	
LSD (0.10):						
Row configuration	NS			NS		
Seeding rate	4.6			1,070		

Notes:

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Table 3. Influence of row configuration and nitrogen rate, averaged over seeding rates, on corn grain yield on Commerce silt loam at the Northeast Research Station, St. Joseph, LA, 2005 and 2006.

	2005			2006		
Nitrogen rate	Single row	Twin row	Average	Single row	Twin row	Average
	bu/a					
150	188.7	190.4	189.6	116.1	125.1	120.6
180	194.3	193.2	193.8	125.8	130.8	128.3
210	196.7	195.4	196.1	133.5	134.7	134.1
240	195.1	200.2	197.7	134.7	137.2	135.7
LSD (0.10):						
Nitrogen rate		2.7			3.2	

Table 4. Influence of row configuration, averaged over irrigation, seeding and nitrogen rate, on grain sorghum yield on Sharkey clay at the Northeast Research Station, St. Joseph, LA, 2005 and 2006.

Row configuration	2005	2006	Average
	lb/acre		
Single row	4,639	6,115	5,377
Twin row	4,947	6,474	5,711
LSD (0.10):	238	63	

Soil Quality And Crop Root Enhancements – Instigated By Strip-Tillage

Presented by Mike Peterson
Precision Tillage Agronomist, Orthman Mfg.

Strip-tillage is changing the way the Southern High Plains growers prepare their seedbeds for row crop production. With intensive irrigated cropping systems, growers are aware of climbing fuel prices, high fertilizer costs, increasing seed costs; and so on all are stimulating thoughts about how to stay in the business. To manage some sort of profit when all is said and done the grower has to cut inputs.

From the farmers shop and into the field, strip-till has changed the way and thinking of pre-plant tillage efforts. Offering 70% of the ground surface to be left no-till and 30% vertically tilled striptillage sets up an ideal seedbed for the young seedling to start and prosper. As part of this system approach, the narrow tilled zone, a better seedbed, precision placed fertilizers, disrupted tillage pans, and a warmer seedbed – growers are discovering enhanced soil quality characteristics. Those features are faster infiltration rates, soil aggregate stability improved, organic matter of the surface layer increases, deeper and more prolific root systems and higher soil porosity giving the farmer savings and gain in yields. Yields are 5 to 15% better than conventional tilled crops with inputs down by 15 to 33%.

What strip-till accomplishes

With strip-tillage the grower pulls a shank with a specific shaped knife through at depths of 4 to 12 inches, pulling soil fabric up and causing a wave effect up and outward at a 35 to 45 degree angle upward to the soil surface. The challenge is to minimize the boil effect and heave the soil and cause blowout of large chunks onto the soil surface. Strip-till tools vary