

# **Influence of Row Configuration, Seeding Rate, and Nitrogen Rate on Grain Sorghum Yield on Macon Ridge**

H.J. 'Rick' Mascagni, Jr. and Bubba Bell

## **Introduction**

Cultural practices are very important in improving grain sorghum yield. Research has found a consistent sorghum yield response to row widths narrower than 40-inches, particularly on alluvial soils. On Macon Ridge soils, narrow rows tend to yield better than wider rows in years with adequate rainfall, while wider rows are superior to narrow row widths in rain deficient years.

For rows less than 30-inches, crops are generally planted on flat seedbeds, which preclude the use of furrow-irrigation. Multiple rows planted on raised beds maintain cultural advantages of raised beds and permits furrow irrigation. In recent years, planters have been introduced that have the capability of planting twin rows on raised beds. For example, commercial planters are available that plant two rows, 9.5-inches apart, on top of 40-inch wide raised beds. Cultural practices such as seeding and nitrogen (N) rate may interact with row spacing. The objective of this research was to evaluate the influence of row configuration (single versus twin row) and seeding and N rate on yield performance of grain sorghum.

## **Procedures**

A field experiment was conducted in 2006 on Gigger silt loam at the Macon Ridge Research Station at Winnsboro, LA to evaluate the influence of row configuration, seeding rate, and N rate on grain sorghum yield. Single rows were planted with a John Deere 7300 planter and twin rows with a Monosem planter on April 27. Single rows were centered and twin rows centered, 9.5-inches apart, on raised 40-inch wide raised beds. Dekalb DKS53-11 was planted at two seeding rates, 78,500 and 104,500 seed/acre, which are equivalent to 6 and 8 seed/ft for single row and 3 and 4 seed/ft for twin rows. Nitrogen rates of 60, 80, 100 and 120 lb/acre were injected using a variable-rate applicator soon after plant emergence. Single and dual knives were used on each bed for the single and dual row configurations, respectively. Cultural practices recommended by the LSU AgCenter were followed.

Experimental design was a randomized complete block with a split plot arrangement of treatments and three replications. Main plot was row configuration and seeding and N rate were factorially randomized as split plots. Grain yield and yield components (heads/acre, kernel weight, and kernels/head) were determined from the two middle rows of four row plots and is reported at 14% moisture. Data was analyzed using the GLM procedure of SAS. The LSD (0.10) was used to evaluate treatment differences when the F-test indicated significance ( $P \leq 0.10$ ).

## **Results and Discussion**

Rainfall was about normal in April, May, and July and below normal in June (Table 1). Among treatments yields ranged from 3,979 to 5,071 lb/acre (Table 2).

Row configuration, single versus twin row, did not significantly affect yield, although the average yield for the twin row was slightly higher than single row, 4,442 versus 4,294 lb/acre (Table 2). Seeding rate of 78,500 seed/acre (6 seed/ft for single row and 3 seed/ft for twin row)

produced similar yield to the higher seeding rate of 104,500 seed/acre (8 seed/ft for single row and 3 seed/ft for twin row). Optimal N rate was between 80 and 100 lb/acre.

Influence of row configuration, seeding rate, and N rate on grain sorghum yield components are presented in Table 3. Although head counts were statistically higher for the higher seeding rate, differences were smaller than expected.

Table 1. Rainfall at Winnsboro, 2006.

Month	Rainfall inches
April	3.66
May	5.51
June	1.86
July	5.88
August	4.86

Table 2. Influence of row configuration (RC), single versus twin row, and seed (SR) and N rate (NR) on grain sorghum yield on Gigger silt loam at Winnsboro, 2006.

Seeding rate <sup>1</sup> no/acre	N rate lb/acre	Row configuration	
		Single	Twin
		-----lb/acre-----	
78,500	60	4,406	4,040
	80	4,236	4,383
	100	4,493	5,071
	120	4,432	3,935
104,500	60	3,968	4,643
	80	4,277	4,477
	100	4,561	4,642
	120	3,979	4,343
	Average	4,294	4,442
LSD (0.10):			
RC			NS <sup>2</sup>
SR			NS
NR			299

<sup>1</sup>Seeding rates, 78,500 and 104,500 seed/acre, were equivalent to 6 and 8 seed/ft for single row and 3 and 4 seed/ft for twin row.

<sup>2</sup>NS=non-significant at the 0.10 probability level.

Table 3. Influence of row configuration and seed and N rate on number of heads/acre, kernel weight, and number of kernels/head on Gigger silt loam at Winnsboro, 2006.

Seed rate	N rate	Heads		Kernel weight		Kernels	
		Single row	Twin row	Single row	Twin row	Single row	Twin row
no/a	lb/a	-----no/acre-----		-----g/100 seed----		-----no/head-----	
78,500	60	51,840	50,920	2.9	3.2	1,307	1,084
	80	59,100	53,270	3.1	3.1	1,041	1,229
	100	54,400	52,760	2.9	3.0	1,263	1,364
	120	55,110	50,920	3.0	3.1	1,265	1,118
104,500	60	64,930	58,690	2.7	3.0	1,063	1,235
	80	64,210	63,500	3.1	2.9	999	1,233
	100	65,640	64,320	3.0	3.0	1,107	1,142
	120	60,740	59,000	3.0	3.0	997	1,160
	Average	59,500	56,670	3.0	3.1	1,130	1,196
LSD (0.10):							
	RC		NS		NS		NS
	SR		6,050		NS		77
	NR		NS		NS		NS