

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

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## **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 can 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 dual row) and seeding rate on yield performance of grain sorghum.

## **Procedures**

A field experiment was conducted in 2007 on Gigger silt loam at the Macon Ridge Research Station (MRRS) near Winnsboro, LA to evaluate the influence of row configuration and seeding rate on grain sorghum yield. Row configuration treatments consisted of single rows and twin rows planted on 40-inch wide, raised beds. Treatments also included four 20-inch rows (narrow rows) planted on a flat seedbed. Single rows were planted with a John Deere 7300 planter, twin rows with a Monosem planter, and narrow rows with a modified Soybean Special on May 10. Single rows were centered and twin rows centered, 9.5-inches apart, on raised 40-inch wide raised beds. Pioneer brand 83G66 was planted at seeding rates of 52,500, 78,500, 104,500, and 130,800 seed/acre, which are equivalent to 4, 6, 8, and 10 seed/ft for single rows and 2, 3, 4, and 5 seed/ft for both twin rows and narrow rows. Prior to planting, 110 lb N/acre as 30-0-0-2 was broadcast and incorporated over the whole experimental area. Cultural practices recommended by the LSU AgCenter were followed.

Experimental design was a randomized complete block with a split plot arrangement of treatments with four replications. Main plot was row configuration and split plot was seeding rates. The seeding rates were repeated within each replication. Grain yield and yield components were determined from the two middle rows of four row plots and is yield 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 & Discussion

Rainfall was about normal in April and May and below normal in June and above normal in July (Table 1).

Average yields for the row configuration treatments were not significant and ranged from 4,748 to 5,163 lb/acre (Table 2). Optimum seeding rate was between 78,500 and 104,500 seed/acre, which is equivalent to 6 and 8 seed/ft on single rows and 3 and 4 seed/ft on twin row and narrow rows. Plants and heads/acre were much lower for twin rows compared to both single row and narrow rows. There was little effect of row configuration and seeding rate on tiller numbers.

Table 1. Rainfall at Winnsboro, 2007.

Month	Rainfall
	inches
April	4.86
May	4.38
June	2.97
July	8.31
August	0.59

Table 2. Influence of row configuration (RC) and seeding rate (SR) on grain sorghum yield and yield components on Gigger silt loam at Winnsboro, 2007.

Row configuration <sup>1</sup>	Seeding rate <sup>2</sup> seed/a	Yield lb/a	Kernel weight g/100	Kernels no/head	Plants no/a	Heads no/a	Tillers no/plant
Single row	52,500	4,468	3.5	1,258	45,740	45,740	1.0
	78,500	4,978	3.4	1,117	72,960	63,160	0.9
	104,500	4,752	3.2	950	86,580	71,870	0.8
	130,800	4,795	3.3	799	102,910	82,760	0.8
	Avg.	4,748	3.3	1,031	77,050	65,890	0.9
Twin row	52,500	4,295	3.4	1,495	44,110	36,480	0.8
	78,500	5,038	3.5	1,550	51,180	41,380	0.8
	104,500	4,976	3.4	1,158	68,610	51,730	0.8
	130,800	5,206	3.4	1,316	72,420	59,350	0.8
	Avg.	4,879	3.4	1,380	59,080	47,240	0.8
Narrow row	52,500	4,825	3.4	1,501	54,450	45,740	0.9
	78,500	4,956	3.4	1,006	67,520	63,160	0.9
	104,500	5,594	3.2	888	79,500	81,680	1.0
	130,800	5,278	3.1	1,147	99,100	74,050	0.7
	Avg.	5,163	3.3	1,135	75,140	66,160	0.9
LSD (0.10):							
RC		NS	NS	NS	NS	NS	NS
SR		400	0.1	182	9,080	6,870	NS
RC x SR		NS	NS	NS	NS	NS	NS

<sup>1</sup>Single row-single row on 40-inch wide, raised beds; Twin row-twin rows 9.5-inches apart on 40-inch wide, raised beds; Narrow row-four 20-inch rows on 80-inch wide seedbed.

<sup>2</sup>Seeding rates, 52,500, 78,500, 104,500, and 130,800 seed/acre, are equivalent to 4, 6, 8, and 10 seed/ft on single row and 2, 3, 4, and 5 seed/ft on twin row.