

# Sorghum seeding rates for best yields

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**M**aximum grain yields are attained only by uniform sorghum stands that allow uniform flowering and ripening. Inadequate stands resulting from low seeding or other causes produce secondary tillers from buds near the base of the plant; secondary tillers mature later than the main head, delaying harvest. Stands that are too heavy can result in lower yields, small kernels, and increased lodging.

Considerable attention has been given to the effects of within-row plant spacing (seed rate) on grain sorghum performance in the Midwest, but little information is available for growing conditions in the southwestern desert.

The effects of seeding rate and year on grain yield of three cultivars (Meloland, Asgrow Double TX, and RS 610) were studied in 1974 and 1975 on heavy soil at the Imperial Valley Field Station. Five seeding rates were used, equivalent to 4.1 (3 seeds per foot), 8.3 (6 seeds per foot), 16.5 (12 seeds per foot), 33.0 (24 seeds per foot), and 66.0 (48 seeds per foot) pounds per acre. The crop was planted on April 15, two rows on a 40-inch bed; Igran herbicide at 1.5 pounds per acre was applied between planting and preirrigation; and the crop was irrigated up. Nitrogen treatment was 150 pounds per acre preplant, followed by 150 pounds sidedressed when the plants were 6 to 8 inches tall.

Emergence counts were taken 16 days after planting, and plant heading or tillering was determined at harvest time in two 16-foot-long rows. Other measurements were flowering date, height, bushel weight, yield, and percent of emerged plants heading.

Seeding rate significantly affected grain yield (fig. 1). The range was 3,347 to 8,274 pounds per acre in 1974 and 4,541 to 7,380 pounds in 1975, with a significant year effect. Differences in yield were greatest with seeding rates between 4.1 and 16.5 pounds per acre, and 16.5 and 66 pounds per acre. Grain production was significantly higher at the 16.5-pound seed rate than at 4.1 or 66 pounds. Each year, grain yields of all three cultivars increased with seeding rate to 16.5 pounds per acre and then decreased.

Production was influenced by per-

centage of viable seeds emerging and percentage of emerged plants heading. Other factors that could influence yield but are not reported here include seed size, number of seeds per head, and number of heads per acre.

Field emergence averaged 56 to 68 percent (fig. 2). There were slight differences among cultivars and highly significant differences among seeding rates.

As indicated in figure 3, the percentage of emerged plants that produced a harvested head, including secondary tillers, ranged from 124 (mean of three cultivars at the 4.1-pound seeding rate) to 43.5 (mean of three cultivars at the 66-pound rate). The two low seeding rates (4.1 and 8.3 pounds per acre) produced secondary tillers, delaying harvest, and yield did not equal that of the 16.5-pound seeding rate, with only 75.7 percent of emerged plants heading. The two high seeding rates (33 and 66 pounds per acre), with only 59.9 and 43.5 percent emerged plants heading, were too thick to give maximum yields. The average number of heads harvested per foot for the seeding rates of 4.1, 8.3, 16.5, and 33 and 66 pounds per acre were 4.0, 6.1, 8.6, and 16.6, respectively.

There were no significant differences among cultivars for plants emerged that produced a harvested head, but there were significant differences among seeding rates.

The effect of seeding rates on flowering date, plant height, and bushel weight did differ significantly among cultivars (see table). The significance within cultivars varied. Delay of flowering date at the low seeding rate was significant for RS 610 and Double TX, and almost significant for Meloland and Double TX.

The results indicate that a seeding rate of around 16 pounds per acre gives optimum grain production. Lower or higher seeding rates decrease production. The commercial practice is to plant from 9 to 20 pounds per acre.

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EFFECT OF SEEDING RATE ON FLOWERING, PLANT HEIGHT, AND BUSHEL WEIGHT OF THREE GRAIN SORGHUM CULTIVARS PLANTED APRIL 15, 1974 AND 1975, AT IMPERIAL VALLEY FIELD STATION (DATA FOR TWO YEARS COMBINED)

Cultivar	Seeding rate (lb/A)					LSD (0.05)
	4.1	8.3	16.5	33.0	66.0	
Date flowered						
RS 610	6/24	6/23	6/22	6/22	6/22	1.3
Meloland	7/3	7/2	7/2	7/1	7/1	NS
Double TX	7/4	7/3	7/2	7/2	7/3	1.4
Plant height (cm)						
RS 610	127	129	132	133	128	NS
Meloland	137	139	131	135	133	7.3
Double TX	140	145	142	139	134	10.5
Bushel weight (lb/A)						
RS 610	57.3	57.8	57.6	57.2	56.9	0.8
Meloland	51.1	52.3	51.5	52.0	52.4	NS
Double TX	55.4	56.1	55.9	55.0	55.6	NS

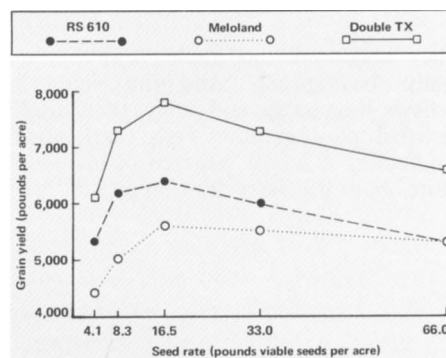


Fig. 1. Effect of seeding rate on yield of three grain sorghum cultivars planted April 15, 1974 and 1975, at Imperial Valley Field Station. Data for two years combined.

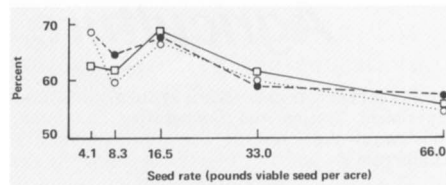


Fig. 2. Percentage of viable seeds emerging of three grain sorghum cultivars planted April 15, 1974 and 1975, at Imperial Valley Field Station. Data for two years combined.

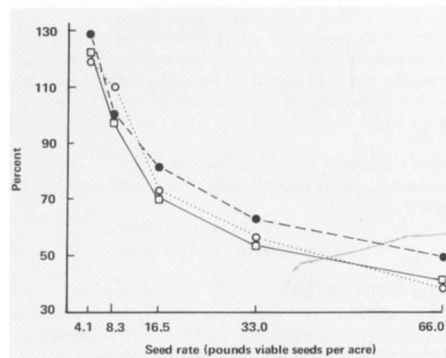


Fig. 3. Percentage of emerged plants heading of three grain sorghum cultivars planted April 15, 1974 and 1975, at Imperial Valley Field Station. Data for two years combined.