THE EFFECT OF PLANT DENSITY AND DATE OF PLANTING ON GUAR SEED YIELDS

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Guar, Cyamopsis tetragonoloba (L.) Taub, is a drought tolerant, summer annual legume grown primarily for the galactomannin gum in the endosperm of its seed. Principally grown in India and Pakistan, it is also cultivated on the high plains of Texas and Oklahoma, and in areas of south Texas and Arizona. Except for Arizona and south Texas the plant is usually grown under natural rainfall conditions.

In order to maximize yields, cultural practices associated with a crop need to be tailored for the environment and genotype grown. The date of planting, row spacing, plant density and irrigation regimens, when applicable, are elementary considerations of the agronomist. Studies about the effects of plant density and date of planting on guar yields using current commercial cultivars under irrigation are uncommon. Thus, a study of their relationships to guar seed yield was undertaken.

The study investigated the effects of three plant densities on the yields of morphologically different guar cultivars at the Marana and Maricopa Agricultural centers. At the Marana station two cultivars and three germplasm lines were evaluated over four dates of planting. In Maricopa four cultivars and three germplasm lines were evaluated at one date of planting (June 8). All plots were planted one row per bed on 100 cm centers and thinned to densities of one, four and six plants per 30 cm at Marana and one, three and six plants per 30 cm at Maricopa. Harvest was performed with a Hege 125 small plot combine.

In Marana the highest mean yields were obtained in the June 1 planting at a density of six plants per 30 cm (Table 1). Lewis was the highest yielding cultivar at all dates of planting (Table 2). In Maricopa, the yields were greatest at the density of six plants per 30 cm with Kinman outyielding all other cultivars or germplasm lines (Table 3).

Table 1. Marana; guar seed yield (kg/ha) by density and date of planting averaged over five cultivars.

Planting Date	Plants per 30 cm			
	1	4	6	Mean
June 1	229a*	517b	855c	534
July 1	331a	781b	819b	644
August 8	151a	444b	494b	363
September 7	11	46	38	32
Mean	181	447	552	395

* Means within a row followed by different letters are significantly different at the .05 and .01 probability levels.

Table 2. Marana; guar seed yield (kg/ha) by variety and date planting averaged over three densities.

Variety	Date of Planting				
	June 1	July 1	Aug 8	Sept 7	Mean
Lewis	618*	758	544a	64	496
Tx78-3726	525	651	429a	24	407
Tx77-3347	466	610	414a	55	386
Tx78-3337	571	564	217b	19	343
Kinman	488	636	212b	2	334
Mean	534	644	363	32	395

* Mean within a column followed by different letters are significantly different at the .05 and .01 probability levels.

A mean separation was not performed if the interaction class in the ANOVA was significant.

Table 3. Maricopa; guar seed yield (kg/ha) by density. Cultivar planted on June 8.

Variety	Plants per 30 cm			
	1	3	6	Mean
Kinman	1401	2203	2167	1924a*
Lewis	879	1650	2360	1630b
Tx78-3726	971	1634	2219	1608b
Tx78-3337	909	1640	2227	1591bc
Santa Cruz	801	1391	1775	1322cd
Tx77-3347	483	1615	1773	1290 d
SL-100	245	1146	1904	1098 d
Mean	813a*	1611b	2061c	1495

* Means within a column or row followed by different letters are significantly different at the .05 and .01 probability levels.