(*Glycine max* L.) (*Sorghum bicolor* L.)

Interference effect of sorghum (*Sorghum bicolor*) on soybean(*Glycine max* L.) growth and grain yield

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.(Hort   and   Orcult,   1991)

(Roush   and   Radosevich,   1985)

.(Burnside *et al*.1972)

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(Holt and Orcult. 1991)

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.(Burnside *et al*.1972

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(Graham *et al*., 1988)

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(Traore *et al*., 2003)

(Felton,   1986)   .

(Wax   and   Pendelton,   1968)   .(Burnside *et al*.1972; Traore *et al*., 2003)

(Molegna   and   Boerboom,   2000)

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.(Clawson *et al*., 1986; Wilcox, 1985)

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.(Roush and Radosevich, 1985; Teasar, 1984)

–   Hort and)

.   .(Orcult, 1991

"(*Sorghum bicolor*) ..."

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.(Hunt, 1982)   .

(*Sorghum bicolor* L.)   :[ ]

TDM = exp [a + b (DAP) + c (DAP) ^{2} +d(DAP)^3]   .

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CGR = exp [a + b (DAP) + c (DAP) ^{2} +d (DAP) ^{3}]*

[3d (DAP) ^{2}+2c (DAP) + b]   .

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RGR = [3d (DAP) ^{2}+2c (DAP) + b]

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EXCEL   SAS   .

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(DAP)   (DM)   ( )

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. Coefficients for equation (1) for shoot dry matter accumulation in different days after planting for different

treatments

| Treatment		Intercept(a)	Linear regression coefficient(b)	Square regression coefficient(c)	Cubic regression coefficient(d)	R^2
20	0	-30.55	1.00523	-0.0092	0.0000279	0.99
	4	-38.77	1.2568	0.01189	0.000037	0.998
	8	-42.61	1.4239	-0.014	0.0000455	0.998
	12	-49.56	1.6701	-0.01688	0.0000565	0.998
30	0	-14.56	0.4948	-0.00371	0.00000817	0.999
	4	-16.62	0.5477	-0.00426	0.0000097	0.997
	8	-17.56	0.5602	-0.00424	0.00000935	0.995
	12	-22.29	0.7047	-0.00564	0.0000139	0.995
40	0	-16.77	0.6486	-0.00606	0.0000186	0.99
	4	-15.03	0.5118	-0.00387	0.0000834	0.999
	8	12.33	0.3774	0.00201	0.000000369	0.999
	12	-10.26	0.27019	-0.00051	-0.0000061	0.999
50	0	-16.31	0.6448	-0.00616	0.00000195	0.99
	4	-13.99	0.5027	-0.00406	0.0000101	0.999
	8	-13.99	0.49025	-0.00383	0.00000913	0.998
	12	-10.95	0.32975	-0.00156	-0.00000088	0.996
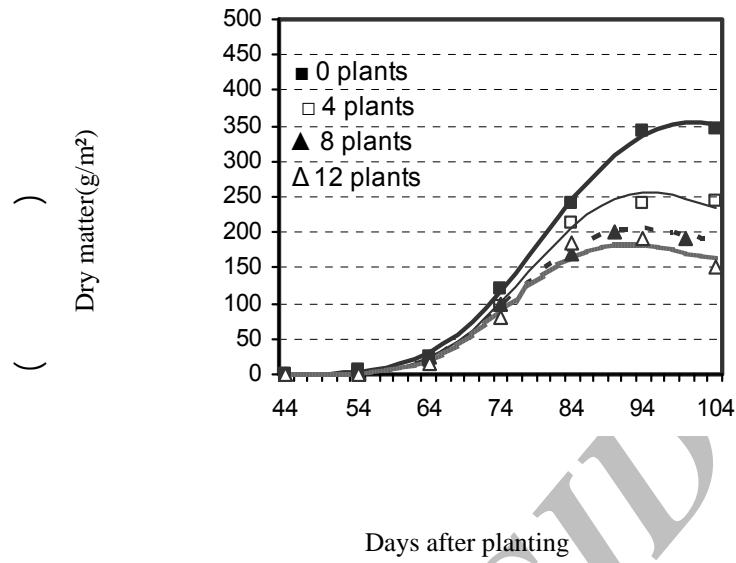
Fig. 1. Variation in dry matter accumulation of soybean in 20 plant density subjected to various plant densities of
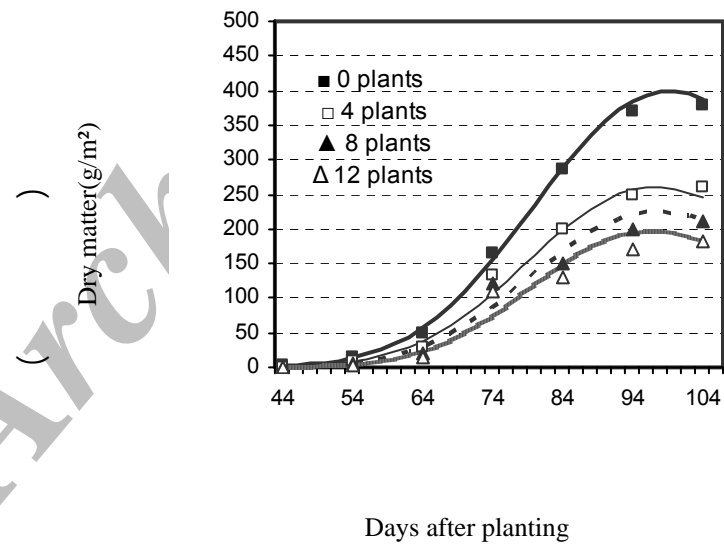
sorghum

Fig. 2. Variation in dry matter accumulation of soybean in 30 plant density subjected to various plant densities of
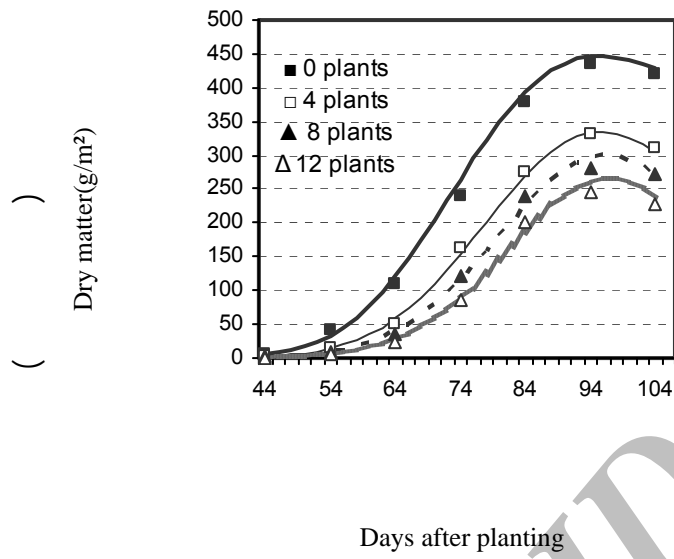
sorghum

Fig. 3. Variation in dry matter accumulation of soybean in 40 plant density subjected to various densities of
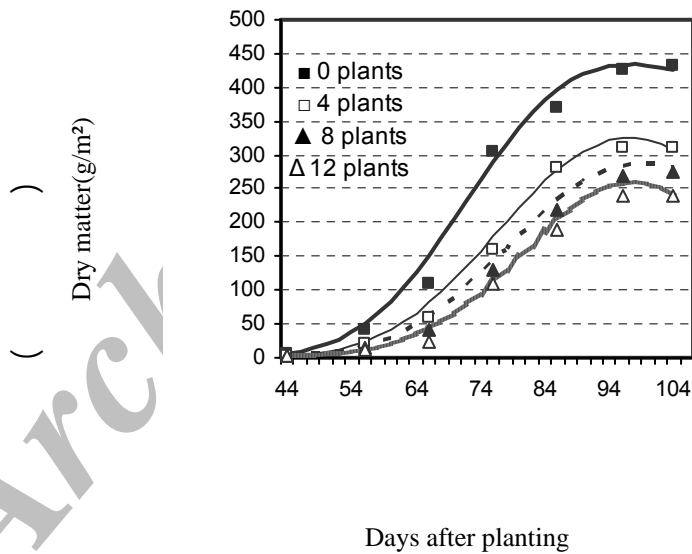
sorghum

Fig. 4. Variation in dry matter accumulation of soybean in 50 plant density subjected to various densities of

sorghum

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(Traore *et al.*, 2003)   .   .
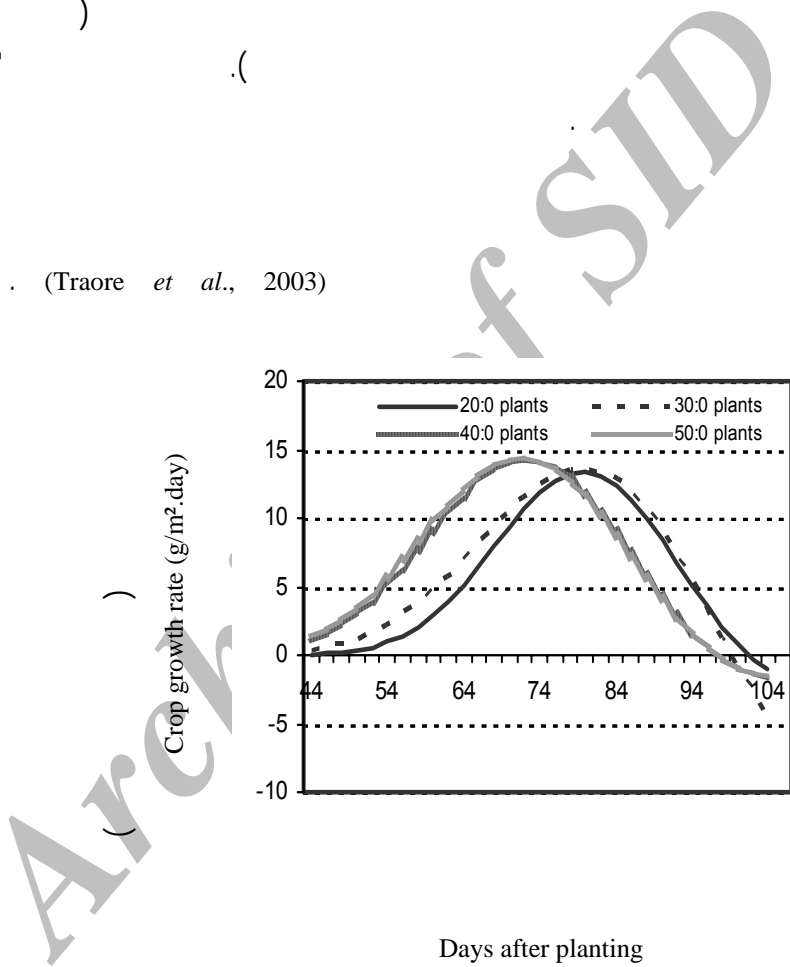
"... (*Sorghum bicolor*)   "

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(CGR)   (   )

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. (Traore   *et   al*.,   2003)

Days after planting

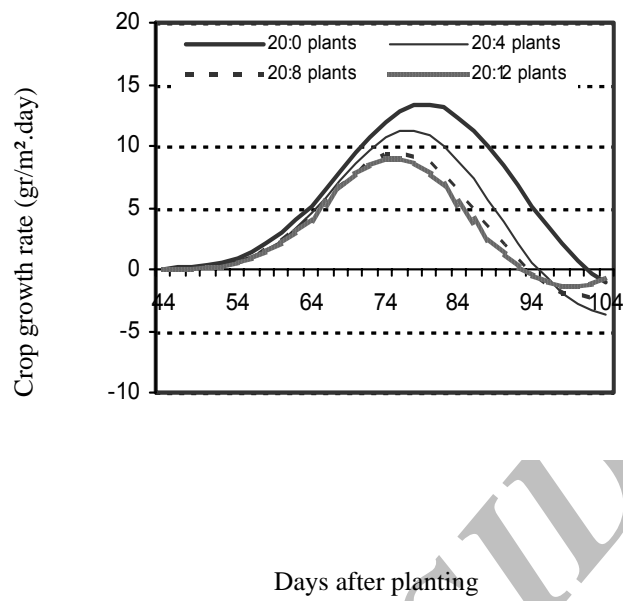Fig. 5. Variation in crop growth rate in monocultures of soybean

Days after planting

Fig. 6. Variation in crop growth rate in 20 soybean density with sorghum densities
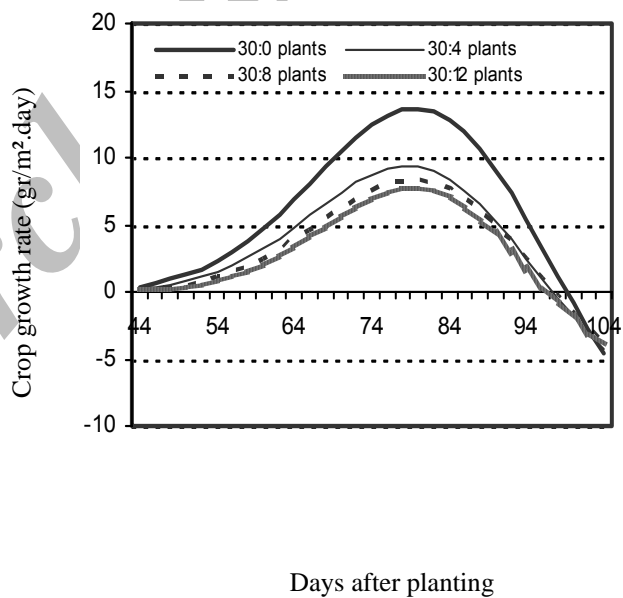
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Days after planting

Fig. 7. Variation in crop growth rate in 30 soybean density with sorghum densities

(CGR)

Days after planting

(CGR)
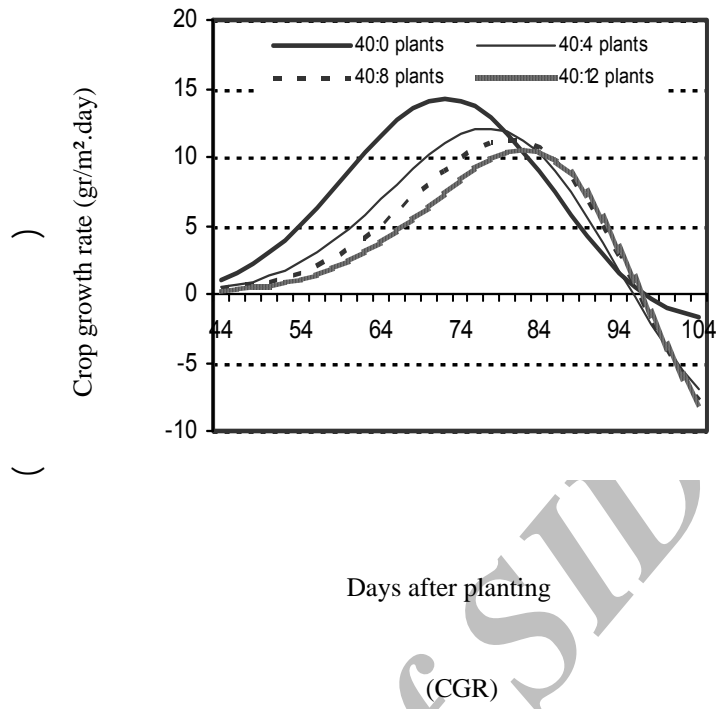
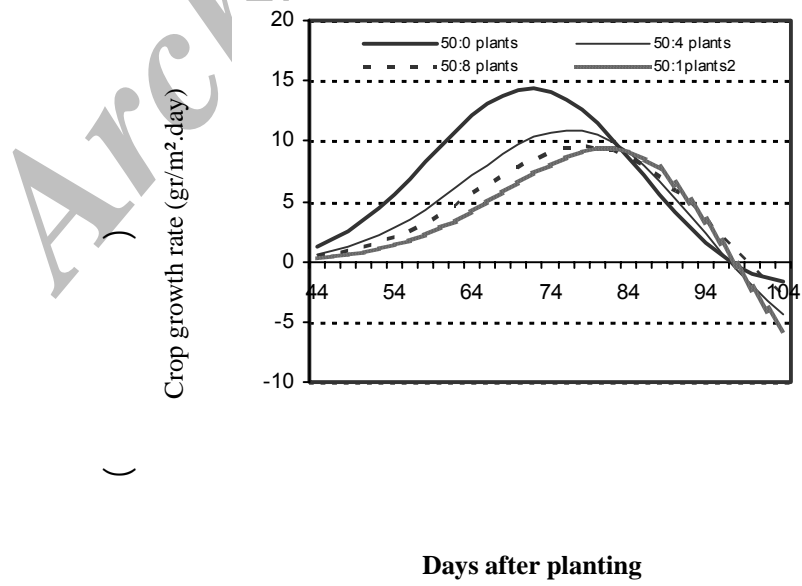Fig. 8. Variation in crop growth rate in 40 soybean density with sorghum densities

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CGR   (   )   CGR   .   CGR
      CGR   .
   (   )   .
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CGR   .   CGR   .(   )
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         CGR   .
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                              CGR   CGR
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Days after planting

Fig.9. Variation in crop growth rate in 50 soybean density with sorghum densities

(CGR)

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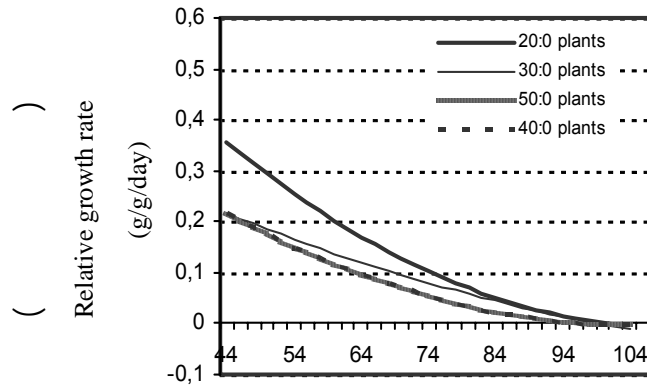
RGR   **(RGR)**

:   RGR   RGR

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RGR

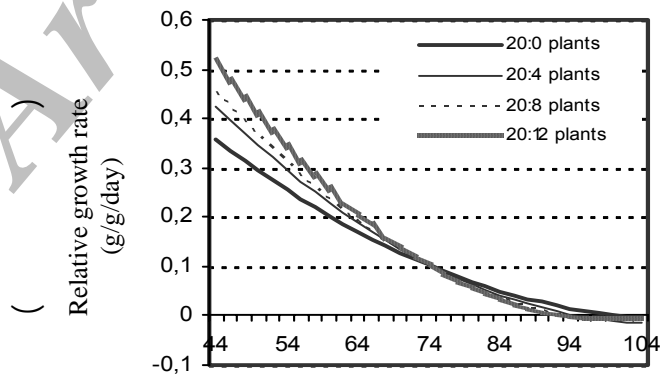.   (   )

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Fig.10. Variation in relative growth rate at monocultures of soybean

(RGR)

Fig. 11. Variation in relative growth rate in 20 soybean density with sorghum densities
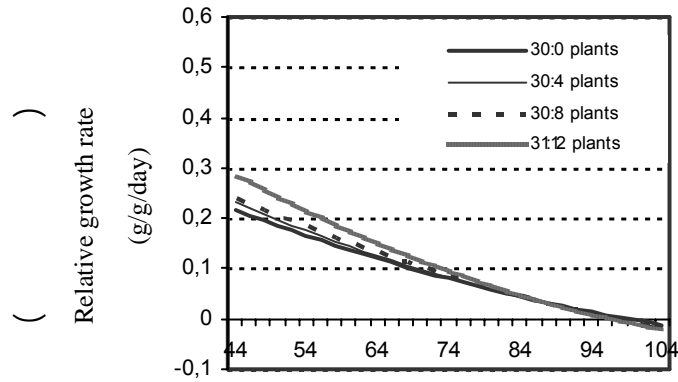
(RGR)

Fig. 12. Variation in relative growth rate at 30 soybean density with sorghum densities
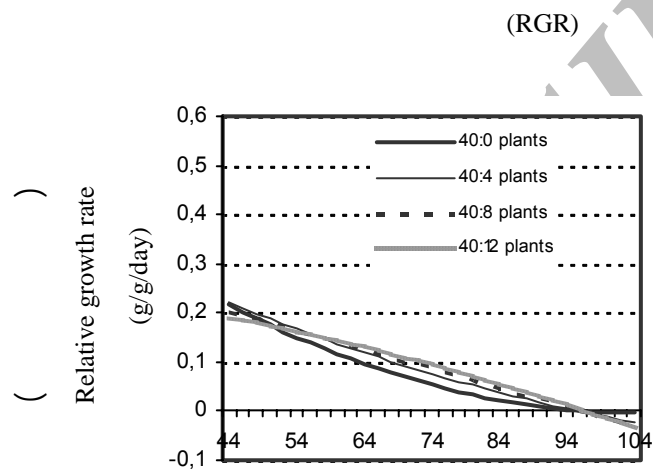
(RGR)

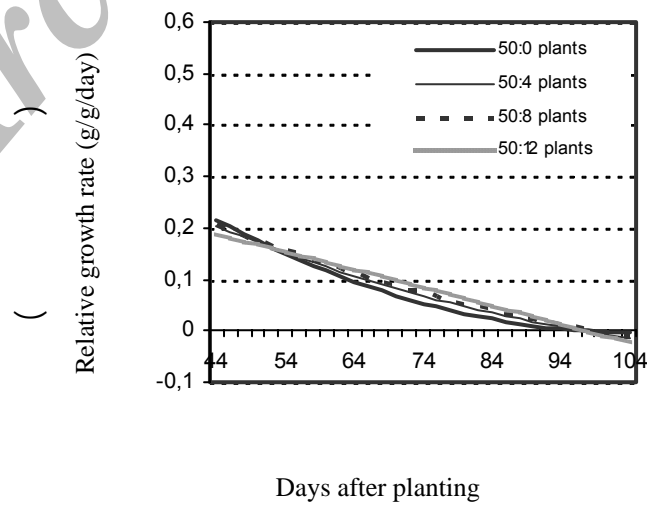Fig. 13. Variation in relative growth rate in 40 soybean density with sorghum densities

(RGR)

Days after planting

Fig. 14. Variation in relative growth rate in 50 soybean density with sorghum densities

(RGR)

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(Tisedale, 1998)   (Tolenar *et al.*, 1994)   .(   )   ( )

(Felton, 1986)   RGR

(Wax   and   Pendelton,   1968)

(Molegna and Boerboom, 2000)

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(Traore *et al.*, 2003)

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(Spiters, 1983)   (Williams and Itayes, 1984)

(Cannel, 1986)   .

Massinga *et al.*,)

(2003

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Table 2. Mean comparison of grain yield for different densities of soybean and sorghum

( ) Soybean density (plants/m²)	( ) Sorghum density (plant/m²)	( ) Soybean grain yield (gm-2)
	0	130.40 c
	4	94.69 d
20	8	70.61 f
	12	45.66 g
	0	153.00 b
	4	111.30 cd
30	8	71.92 f
	12	53.42 fg
	0	182.90 a
	4	131.90 c
40	8	92.96 de
	12	66.03 fg
	0	183.40 a
	4	117.10 c
50	8	74.19 ef
	12	48.33 g
	0	160.40 a
	4	113.70 b
	8	77.43 c
	12	53.36 d

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"... (*Sorghum bicolor*)   "

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Interference effect of sorghum *(Sorghum bicolor L.)* on soybean *(Glycine max L.)* growth and grain yield.

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ABSTRACT

Raie, Y., K. Ghasemi. Golozani, A., Javanshir, H. Alyari, S. A. Mohammadi and S. Nasrollahzadeh. 2007. Interference effect of sorghum *(Sorghum bicolor L.)* on soybean *(Glycine max L.)* growth and grain yield. Iranian Journal of Crop Sciences. 9 (2): 125-141.

To evaluate the effect of sorghum interference on soybean growth parameters and grain yield, a field study was conducted in experimental field of the Faculty of Agriculture, The University of Tabriz during 2002 and 2003. Treatments were arranged in a factorial experiment using a randomized complete block design with three replications with additive series method. The first factor consisted of soybean densities of 20, 30, 40, and 50 pants/m^2 and the second factor included sorghum densities of 0, 4, 8, and 12 plants/m^2. Results showed that the highest dry matter accumulation (DMA), crop growth rate (CGR) and grain yield (GY) of soybean were observed in pure stands of soybean. Among pure stands, the highest and the lowest DMA, CGR and GY were achieved in soybean densities of 50 and 20 plants/ m^2, respectively. These parameters were decreased by increasing sorghum density. However, the loss rate was higher at 4 plants/m^2 as compared to other sorghum densities. Therefore, it can be concluded that DMA, CGR and GY are decreased, due to increasing sorghum density; however, these parameters are slightly affected by soybean density.

Keywords: Soybean, Sorghum, Crop Growth Rate (CGR), Relative Growth Rate (RGR).