

()

*

(// : // :)

Archive of SID

(Malakoti & Nafici, 1992)

(Raun & Johnson, 1999)

(Fisher & Wilson, 1975;
Khaitri & Vanderlip, 1992; Gardner et al., 1994;
(1993) Rosolem et al. .Shalj et al., 1995)

Dashora et al
(1992)

(Cassman et al., 1998)
Amano & .(Berenguer & Faci, 2001)
(1991) Salazar

(Goodroad &
Jellum, 1988)

(Ericson, 1993)
(Wilman &
Rezvani Moghaddam, 1998; Mokhtarzadeh &
(1994) Gardner et al. .Rezaei, 1997

(Cassman et al., 1998;
(1987) Raut & Ali
.Pal et al., 1996)

(1986) Harumoto et al.

(Rashed Mohassel
Berenguer & Faci .et al., 1997)
(1970) Owen & Moline (2001)

Malakoti & Nafici,)
(1992)

Goodroad & Jellum

(1993) Ericson (1988)

$$E_e = (Y_{df} - Y_{ef}) / F$$

() : Ee
: Ydf
() : Yef
() : F

Excel SAS

Archive of SID

Shalji (1996) Pal et al. (1995) Bhan et al.
 (1995) Wanjari et al. (1995) et al.

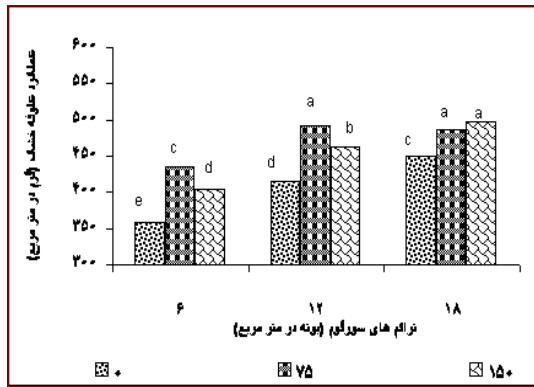
()

()

()

()

()



Gardner et al. (1975) Fisher & Wilson

Sasha & (1992) Khaitri & Vanderlip (1994)

(1997) Bhatia

()

/	/	**	/	**	/	**	/	**	**	/	**
/	/	**	/	*	/	*	/	**	/	**	/
/	/	/	/	/	/	/	/	/	/	/	()
/	*	/	**	/	*	/	**	/	*	/	*
/	/	/	**	/	/	/	/	/	/	/	x
/	/	/	/	/	/	/	/	/	/	/	()
/	*	/	**	**	/	**	/	**	/	**	**
/	/	/	**	/	*	/	/	/	/	/	x
/	/	/	**	/	/	/	/	/	/	/	x
/	/	/	/	/	/	/	/	/	/	/	x
/	/	/	/	/	/	/	/	/	/	/	x
/	/	/	/	/	/	/	/	/	/	/	()

** *

...

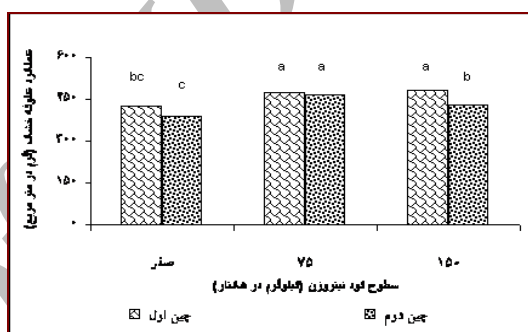
:

() ()	() ()	() ()	() ()	() ()	() ()	() ()	() ()
/ b	/ a	/ c	/ c	/ a	/ a	/ c	
/ a	/ a	/ b	/ b	/ a	/ b	/ b	()
/ b	/ a	/ ab	/ a	/ a	/ b	/ a	
/ a	/ c	/ a	/ a	/ c	/ a	/ c	
/ a	/ b	/ b	/ b	/ b	/ a	/ ab	/ b
/ b	/ a	/ c	/ c	/ a	/ a	/ b	/ a
/ a	/ a	/ a	/ b	/ a	/ a	/ b	/ a
/ b	/ b	/ b	/ a	/ a	/ a	/ a	/ b

()

× ()

() =



)

(Chen & Zhang, 1995)

(FR)

()

(R)

()

FR/R

(Rashed Mohassel et al., 1997)

()

FR/R (2000) Ballare & Casal

(1997) Mokhtarzadeh & Rezaei ()

:

()

Aga alikhani

()

(1993)

/

()

(2000) Ballare & Casal .

(FR)

FR/R

(Rajcan & Swanton, 2001)

Wilman et al. .()

(1996)

(Ballare & Casal, 2000)

()

()

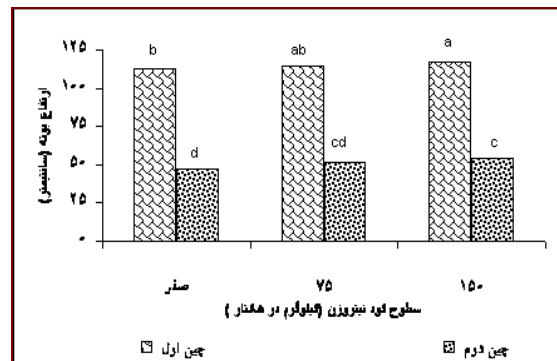
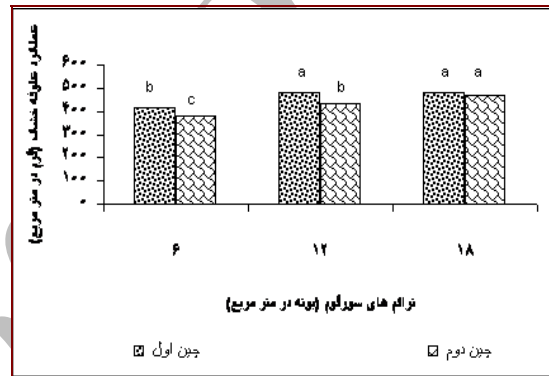
Wilman & Rezvani Moghaddam .()

(1996) Wilman et al. (1998)

()

(1998) Wilman & Rezvani Moghaddam

(1996) Wilman et al.



()

()

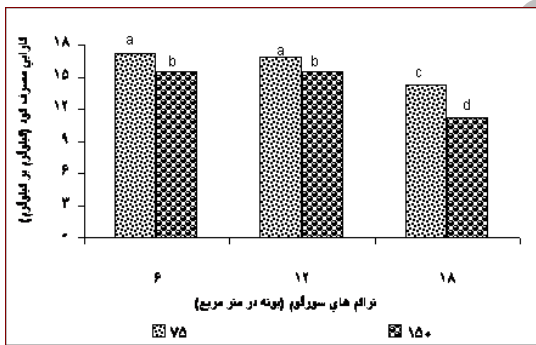
()

()

()
 (1988) Goodroad & Jellum

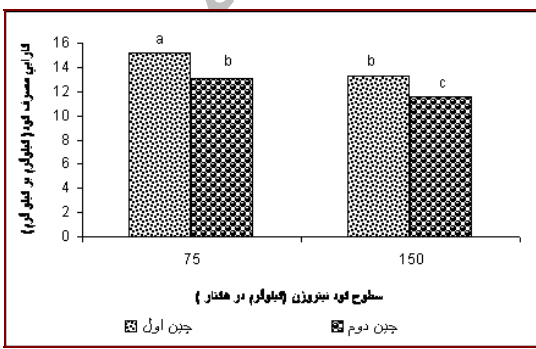
Cerighton & ()
 (1997) Rolf

()



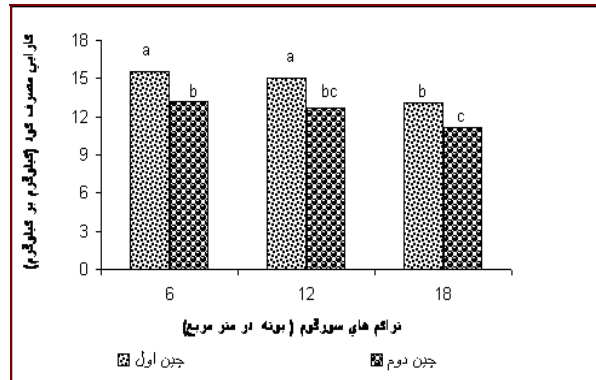
()
 ()

()



/	**	
/	**	
/	**	
/	**	x
/	*	
/	*	x
/	**	x
/		x
/		x
/		

** *



REFERENCES

1. Aga alikhani, M. (1993). Study the effect of different levels of nitrogen and methods of N application on growth, quantitative qualitative characteristics of forage sorghum. In: Proceedings of the 3th Iranian Crop Science Congress. College of Agriculture, University of Tabriz, Tabriz, Iran. Pp. 436 (In Farsi).
2. Amano, L. O. & Salazar, A. M. (1991). Comparative productivity of corn and sorghum as affected by population density and nitrogen fertilization. *Sorghum and Millet Abstracts*, 16, 5-11.
3. Ballare, C. J. & Casal, J. (2000). Light signals perceived by crop and weed plants. *Field Crop Research*, 67, 149-160.
4. Berenguer, M. J. & Faci, J. M. (2001). Sorghum yield compensation processes under 12 different plant densities and variable water supply. *European Journal of Agronomy*, 15, 43-55.
5. Bhan, S., Utam, S. K. & Radhey, S. (1995). Effect of conservation of rain fed sorghum. *Indian Journal of Soil Conservation*, 23, 24-29.
6. Cassman, K. G., Peng, S., Oik, D. C., Ladha, J. K., Reichardt, W., Doberman, A. & Singh, U. (1998). Opportunities for increased nitrogen-use efficiency from improved resource management in irrigated rice systems. *Field Crop Research*, 56, 7-39.
7. Cerighton, G. & Rolf, C. (1997). Horticultural fertigation, techniques, equipments and management. Available on www: url: <http://www.Agric.Nsw>.
8. Chen, W. & Zhang, L. B. (1995). Effect of different maize type on canopy properties, light distribution and dry matter production of maize population. *Acta Agronomica Sinica*, 21, 83 – 89.
9. Dashora, L. N., Shaktawat, M. S. & Porwal, B. L. (1992). Effect of sowing time, plant population and nitrogen on yield of sorghum genotypes. *Indian Journal of Agronomy*, 37, 821-823.
10. Ericson, N. A. (1993). Quality and storability in relation to fertigation of apple trees cv. Summerred. *Acta Horticulture*, 326, 73- 83.
11. Fisher, K. S. & Wilson, G. L. (1975). Studies of grain production in Sorghum bicolor L. Moench. VII. Contribution of Plant to canopy photosynthesis and grain yield in field situations. *Australian Journal of Agriculture Research*, 27, 235-242.
12. Garavetta, G., Cherney, J. H. & Johnson, J. D. (1990). Within-row spacing influences on diverse sorghum genotype. II. Dry matter, yield and forage quality. *Agronomy Journal*, 82, 210-215.
13. Gardner, J. C., Maranville, J. W. & Paparozzi, E. T. (1994). Nitrogen use efficiency among diverse sorghum cultivars. *Crop Science*, 34, 728-733.
14. Goodroad, L. L. & Jellum, M. D. (1988). Effect of N fertilizer rate and soil pH on N efficiency in corn. *Plant and Soil*, 106, 85- 89.
15. Harumoto, Y., Uzuta, Y. & Matsui, T. (1986). Effect of additional fertilizer and harvesting time on the production and nutritive value in dual purpose sorghum. Bulletin of the Faculty of Agriculture. Shimane University. Japan. No. 20, 13-18.
16. Khaitri, Y. O. & Vanderlip, R. L. (1992). Grain sorghum and pearl millet response to date and rate of planting. *Agronomy Journal*, 84, 579-582.
17. Malakoti, M. J. & Nafici, M. (1992). *Fertilization of Dry land and Irrigation Soils*. Tarbiat Moddaress University. Press, Tehran. Iran. (In Farsi).
18. Mokhtarzadeh, H. & Rezaei, G. R. (1997). Study the effect of density and planting method on yield and yield components of grain sorghum KGS-5 cultivar in conditions of Isfahan. Annual report of Seed and Plant Improvement Institute of Isfahan. 65 pp.(In Farsi).
19. Novoa, R. & Loomis, R. S. (1981). Nitrogen and plant production. *Plant and Soil*, 58, 177-204.

- ...
- :
20. Owen, F. G. & Moline, W. J. (1970). Sorghum for forage. In: J. S. Wall and W. M. Ross (ed.) *Sorghum production and utilization*. (PP. 382-415). West Port Connecticut,
 21. Pal, M. S., Singh, O. P. & Malik, H. P. S. (1996). Nutrient uptake pattern and quality of sorghum L. *Sorghum bicolor* Moench genotypes as influenced by fertility levels under rain fed condition. *Tropical Agriculture*, 73, 6-9.
 22. Rajcan, I. & Swanton, C. J. (2001). Understanding maize weed competition: Resource competition, light quality and the whole plant. *Field Crop Research*, 71, 139-150.
 23. Rashed Mohassel, M. H., Hossaini, M., Abdi, M. & Mollafiaei, A. (1997). *Cereals*. Iranian Academic Center for Education, Culture and Research (ACECR) Mashhad Press. 406 pp. (In Farsi).
 24. Raut, M. S. & Ali, M. (1987). Productivity of forage sorghum as influenced due to nitrogen and phosphorus under rain fed condition on vertisol of Burdelkhand tract. *Indian of Agriculture Research*, 21(3), 171-174.
 25. Raun, W. R. & Johnson, G. V. (1999). Improving nitrogen use efficiency for cereal production. *Agronomy Journal*, 91, 357-363.
 26. Rosolem, C. A., Kato, S. M., Nachado, J. R. & Bicudo, S. J. (1993). Nitrogen redistribution to sorghum grain as affected by plant competition. *Plant and Soil*, 155, 199-202.
 27. Sasha, A. & Bhatia, J. (1997). Effect of weather on response of sorghum (*Sorghum bicolor* L. Moench) to long term fertilizer application through cluster analysis. *Indian Journal of Agronomy Science*, 67, 184-188.
 28. Shalji, M., Hasan, M. V. & Bajlan, B. (1995). Genotype responses of sorghum to fertility variation in scarce rainfall shallow soil ecosystem. *Ann. Agronomy Research*, 16, 369-373.
 29. Shedrick, R. D. (1971). Trials of sorghum for forage. The Grassland Research Institute Hhrley, Maleden head, Berks. *Technical Report*, 9.
 30. Wanjari, S. S., Mahakulkar, B. V. & Shekar, V. B. (1995). Response of kharif sorghum genotypes to applied nitrogen. *Agriculture Science Digest*, 15, 207-208.
 31. Wilman, D. & Rezvani Moghaddam, P. (1998). In vitro digestibility and neutral detergent fibre and lignin content of plant parts of nine forage species. *Journal Agriculture of Science Cambridge*, 131, 51-58.
 32. Wilman, D., Mtengeti, E. J. & Moseley, G. (1996). Physical structure of twelve forage species in retention rate of intake by sheep. *Journal Agriculture of Science*, 126, 277-285.

Archive of SID