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**(*Cuminum cyminum* L.)**

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(Amirnpoor & Moosavi, 1995)

( )

(Tavoosi, 2000)

(Omidbaigi, 2007)

(2002) Farahza Kazemi et al.

$$\frac{1}{3}FC \quad \frac{2}{3}FC \quad FC$$

FC

(Farzaneh,

.1990)

(2004) Balandari

(*Cuminum cyminum*)

(2004) Bagheri & Mazaheri Laghob

(Kafi, 2002)

(Kafi, 2002)

(Kafi, 2002; Tatari, 2004)

(Kafi, 2002)

(2000) Tavoosi

Li & Jiang .

(2004)

Jirovets & Buchbouer

(2005)

(2005) Iacobellis et al. .

(2004) Tatari

(Kafi,

2002; Li & Jiang, 2004; Mazandarani et al., 2004;

.Yan et al., 2002)

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 [(I)  
 [(F)

/  
 / /  
 )  
 (

/ ms/cm EC

)  
 (

(GC/mass)

Mstat-C

-	/	pH
ms/cm	/	EC
meq/litr	/	Ca + Mg
meq/litr	/	Na
meq/litr	/	HCO3
meq/litr	/	Cl
meq/litr	/	SO4
meq/litr	/	
meq/litr	/	
-	/	SAR
%	/	ESP
%	/	
%	/	
%	/	
%	/	N
ppm	/	P
ppm	/	K
%	/	

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(I)

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(P<0.05)

(P<0.05)

(1995) Aminpoor & Moosavi

I I

(2004) Tatari

ns	ns	ns	**	**	/ **	/ ns	/ ns	/ ns
/ ns	ns	*	**	*	/ **	/ ns	/ **	/ ns
/ ns	ns	**	**	**	/ **	/ ns	/ ns	/ ns
/ ns	ns	/ ns	/ ns	ns	/ ns	/ ns	/ ns	/ ns
/					/	/	/	/
(%)								
ns % * % **								

a	a	b	b	b	/ a	/ a	/ a	/ b	$F_1$
a	a	a	a	a	/ a	/ a	/ a	/ a	$F_2$
/			/	/	/	/	/	/	LSD
a	a	b	b	b	/ a	/ a	/ a	/ b	$I_1$
a	a	a	a	a	/ a	/ b	/ a	/ a	$I_2$
a	a	a	a	a	/ a	/ b	/ a	/ a	$I_3$
/	/	/			/	/	/	/	LSD
a	b	c	c	c	b	/ a	/ a	/ c	$I_1F_1$
a	ab	bc	bc	bc	/ ab	/ ab	/ a	/ bc	$I_1F_2$
a	ab	abc	bc	abc	/ ab	/ bc	/ a	/ bc	$I_2F_1$
a	a	a	a	a	/ a	/ c	/ a	/ a	$I_2F_2$
a	ab	bc	bc	bc	/ ab	/ bc	a	/ bc	$I_3F_1$
a	a	ab	ab	ab	/ ab	/ bc	/ a	/ ab	$I_3F_2$
/	/		/	/	/	/	/	/	LSD

:F<sub>2</sub> :F<sub>1</sub>

:I<sub>3</sub> :I<sub>2</sub> :I<sub>1</sub>

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I F

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(P<0.05)

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(Aminpoor & Moosavi, 1995; Kafi,

.2002; Tatari, 2004)

(2004) Saboor-Bilandi .

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(Kafi, 2002)

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.(Kafi, 2002; Tatari, 2004)

(P<0.05)

(Omidbaigi,

.2007)

(Aminpoor &

.Moosavi, 1995; Kafi, 2002; Tatari, 2004)

(Balandari, 2004;

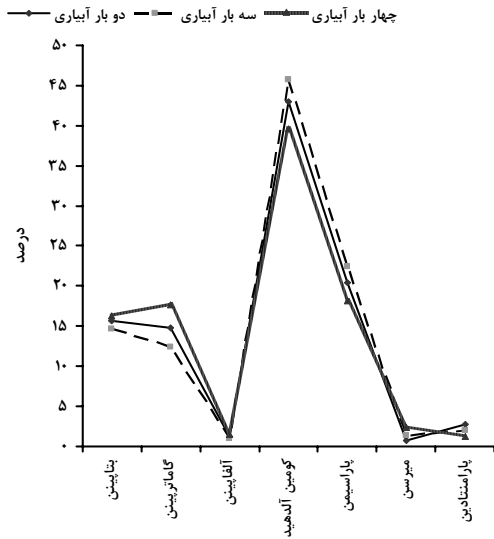
.Mazandarani et al., 2004)

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(P<0.05)

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(Balandari, 2004; Mazandarani et al., 2004)



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(P<0.05)

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(P<0.05)

(P<0.05)

(P<0.05)

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(P<0.05)

/	ns	/	ns	/	ns	/	ns	/	ns	/	ns	/	ns
/	**	/	**	/	**	/	**	/	**	/	**	/	**
/	**	/	ns	/	**	/	*	/	**	/	**	/	**
/	*	/	**	/	ns	/	ns	/	ns	/	**	/	ns
/	/	/	/	/	/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/	/	/	/	/	(%)
					ns	%			*	%		**	

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## REFERENCES

1. Aminpoor, R. & Moosavi, S. F. (1995). The effect of irrigation times on cumin yield and its components. *Agricultural Science and Natural Resources*, 1, 1-7. (In Farsi).
2. Bagheri, A. & Mazaheri Laghab, H. (2004). The effect of cumin leaf spraying by Zn and Mn micro nutrient on its yield and essential oil percentage. In: Proceedings of *Cuminum cyminum*. 2 Dec. Azad University of Sabzevar. P: 44-47.
3. Balandari, A. (2004). Study of seed germination, growth and essential oil in cumin cultivars. In: Proceedings of *Cuminum cyminum*. 2 Dec. Azad University of Sabzevar. P: 48-52.
4. Farahza Kazemi, S., Farahi Ashnaini, S. & Sharifi, A. (2002). The effect of water stress on seed yield components of *Cuminum cyminum*. *Research and production J*, 54,42-45.
5. Farzaneh, H. (1990). *Agrochemistry*. Avaye Noor Press. P: 148.
6. Iacobellis, N. S., Takayanagi, T. & Kitajmi, J. (2005). Antibacterial activity of *Cuminum cyminum* L. and *Carum carvi* L. essential oils. *J Agric Food Chem*, 53(1), 57-61.
7. Jirovets, L. & Buchbouer, G. (2005). Composition, quality control and antimicrobial activity of the essential oil of Cumin (*Cuminum cyminum* L.) from Bulgaria that had been saved for up to 36 years. In: *J Food Sci Techn*, 40.
8. Kafi, M. (2002). *Cumin, production and processing*. Ferdowsi University of Mashhad. PP: 195.
9. Li, R. & Jiang, Z. T. (2004). Chemical composition of the essential oil of *Cuminum cyminum* L. from china. *Tianjin*, 19(4), 311-313.
10. Mazandarani, M., Ghaemi, A., Ghanbarzadeh, S., Kiaii, A. & Kiaii, R. (2004). Identify of important and effective elements of essence and determining of antibacterial of cumin in Golestan province. In: Proceedings of 2<sup>nd</sup> medicinal plant symposium. Tehran Shahed University. P: 273.
11. Omidbaigi, R. (2007). *Production and processing of medicinal plants*. Behnashr pub. 340pp.
12. Saboor-Bilandi, M. (2004). The effect of different levels of manure on cumin yield in Gonabad region. In: Proceedings of *Cuminum cyminum*. 2 Dec 2004. Azad University of Sabzevar. P: 88-89.
13. Tatari, M. (2004). *The effect of different salt levels and irrigation times on growth and yield of cumin in Mashhad region*. MsC thesis in Agronomy. Ferdowsi University of Mashhad. PP: 131.
14. Tavoosi, M. (2000). *Effect of different irrigation regimes on cumin yield components*. MsC thesis in irrigation. Ferdowsi University of Mashhad. PP: 95.
15. Tazari, A. M. & Fahimi, H. (2004). Salt stress effect essential oils components of cumin in tissue culture and whole plant. In: Proceedings of *Cuminum cyminum*. 2 Dec. Azad University on Sabzevar. P: 79-81.
16. Yan, J. H., Tang, K. W., Zhong, M. & Deng, N. H. (2002). Determination of chemical components of volatile oil from *Cuminum cyminum* L. by gas chromatography-mass spectrometry. *Se Pu*, 20(6), 569-72.