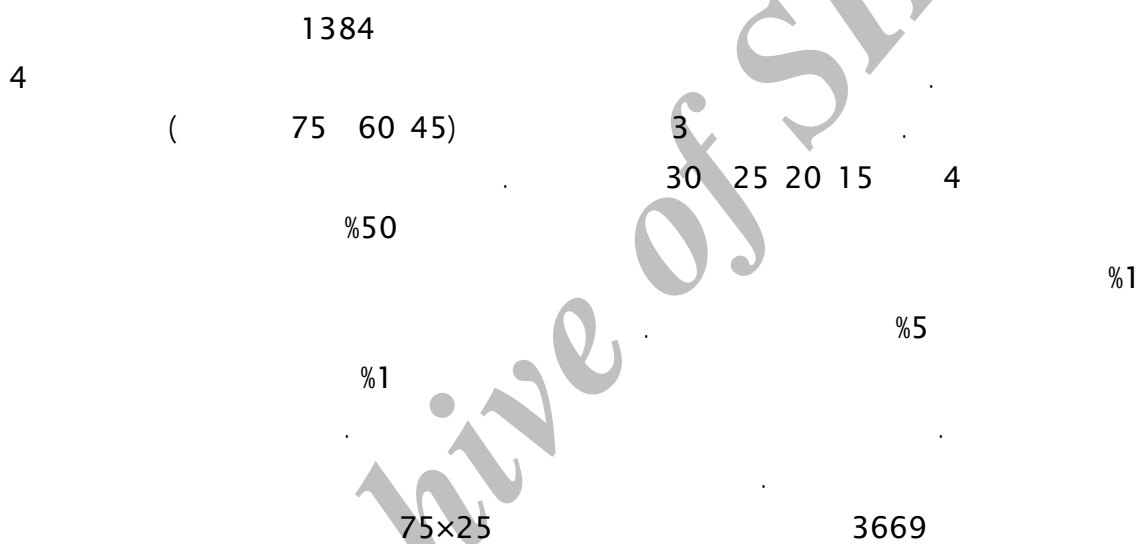


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Effects of Density and Planting Arrangement on Yield and Yield Components of Sunflower

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Abstract

To determine the optimum sowing and sowing pattern of sunflower (Azargol cultivar), an experiment was conducted at Agriculture Research Station of Uremia, Iran during 2005-2006. A split-plot design based on randomized complete blocks with four replications was used. The main factor involved three row distances (45, 60 and 75 cm) and the subplot factor involved four plant distances on the row (15, 20, 25 and 30 cm). The results indicated that the space between the rows had significant effect on grain yield, head diameter, weight of 1000 seeds, number of seeds per head, percentage of hollow grains and number of rings per head. Furthermore, seeds per head, 1000 seed weight, head diameter, percentage of hollow grains and rings per head were significantly affected by the within-row distances. There was also a significant interaction of row space \times plant distance on row for grain yield. Based on these results, regarding grain yield, sowing pattern of 75 \times 25 was recommended for sunflower cultivation in Uremia and similar regions.

Key Words: Plant density, Sowing pattern, Sunflower, Yield and yield Components

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(*Heliantus annuus*)

Astraceae

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30 20

(1975)

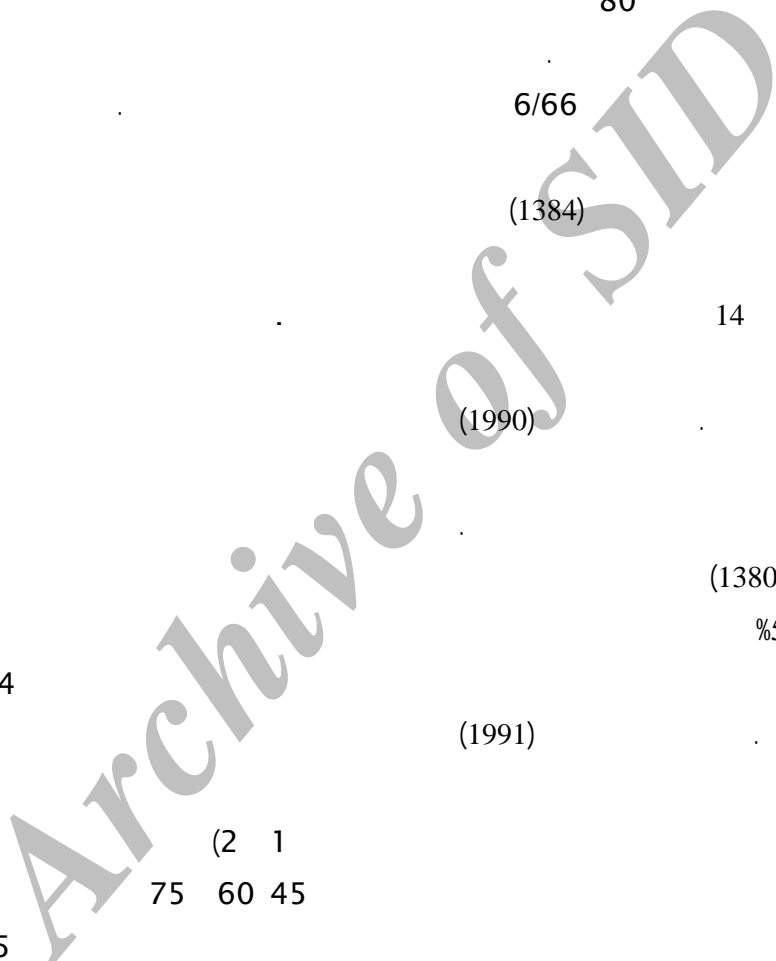
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20/7	96/1	234/3	80	29	55	15/9	2/8	9/4
51/3	182	299/9	85	39	62	21/6	7/7	14/7
0/6	259	358/1	77	32	55	27	11/3	19/1
0	281/5	384/1	75	31	53	30/8	14/6	22/7
9	295/7	357/7	76	28	52	32/5	16/8	24/7
2/8	250/8	336/7	82	31	57	28/4	11/3	19/8
2/6	133/3	295/8	82	31	57	22/7	6/6	14/6
20/5		197/2	86	47	67	13/7	7	7/2
7/2		193/4	89	46	68	12/3	1/4	5/4
29/5		133/4	89	55	72	3	5/8	1/4
72		171	87	51	69	4/5	5/8	0/7
21/8		226/6	80	34	57	12/7	1/2	5/8

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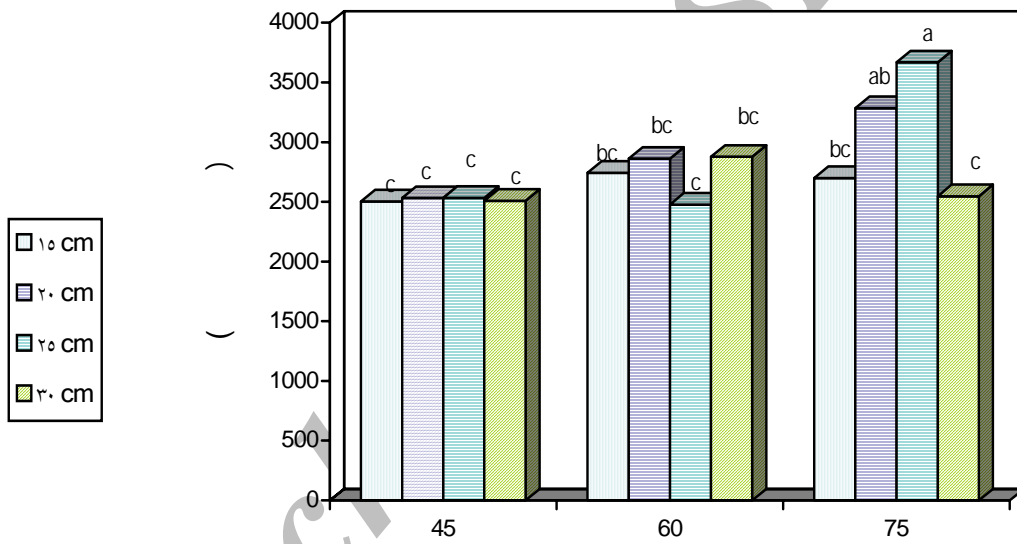
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			1	0/526**	0/005	0/149	0/034	0/008		6	
		1	0/783**	0/341**	0/107	0/17	0/103	0/053		7	
	1	0/19	0/154	0/03	0/138	0/105	0/184	0/179		8	
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(kg/ha)	(kg/ha)	(kg/ha)	(kg/ha)	(kg/ha)	(g)	(cm)	%50				
278836/24	22391/84	35/51**	17199978/83	176989/625	1/26	177/41	0/139	7/767	1/076	3	
1138114/19*	406193/06**	20/93**	53785040/058	160756/534*	0/86	302/25	15/89*	20/611*	31/896**	2	
			*								
91657/35	17557/76	2/28	7058906/077	31835/683	4/85	70/083	2/868	4/254	0/368	6	
242701/22	98103/01	4/25	4315928/83	224291/42**	1/34	263/639**	12/139**	47/622*	14/91**	3	
								*			
490532/069*	110199/56	5/023	5945121/17	26814/186	0/48	9/806	0/368	1/114	0/451	6	×
187103/15	55131/65	4/606	4602748/81	23234/490	2/13	60/380	2/73	3/113	0/678	27	
15/61	17/15	4/34	23/25	23/55	1/96	14/29	21/46	13/95	1/44	(%)	
										1 5	** *

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(kg/ha)	(kg/ha)	(%)	(kg/ha)	(kg/ha)	(g)	(cm)	%50	(cm)			
2520 b	1226b	49/00 b	6464b	533/700b	74/50a	51/88a	8/5 a	11/36b	58/69a	45	
2740ab	1340b	48/72b	9065a	684/1 ab	74/62a	53/75a	8/18a	13/04ab	57/5 b	60	
3051a	1541 a	50/47a	9365a	723/8a	74/95a	57/75a	6/56 b	13/53a	55/88c	75	

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(kg/ha)	(kg/ha)	(kg/ha)	1000		(cm)	%50	(cm)			
			(g)	(g)						
2649a	1286a	48/83a	8097a	485/50c	74/36a	48/670b	6/580b	10/160c	56c	15
2893a	1443a	49/72a	8256a	605/9bc	74/46a	52/83ab	7/33ab	11/97bc	57/08b	20
2894a	1451a	50/08a	8538a	693/9ab	75/06a	56/33ab	8/33ab	13/85ab	57/67b	25
2645a	1296a	48/97a	8299a	803/5a	74/8a	60a	8/75a	14/6a	58/67a	30

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(kg/ha)	(kg/ha)	(kg/ha)	1000		(%)	(cm)	%50	*		
			(g)	(g)				(cm)		
2504c	1179a	47/5300c	7461bc	351/10e	74/06a	44 c	7/25 abc	8/123e	57cd	45×15
2532c	1258bc	/530abc	6668bc	559/7de	74/06a	53abc	8/25ab	11/13d	58/75ab	45×20
2534c	1269bc	49 51/22ab	6039 c	596/5cd	75/41a	54abc	9 a	/96abcd	59ab	45×25
2509c	1199c	47/72bc	5687 c	625/7bcd	74/46a	56/5abc	9/5a	12 /25abcd	60a	45×30
2744bc	1327bc	48/4 abc	10110ab	610 bcd	74/39a	50/5 bc	7/25 abc	13 10/79 d	56de	60×15
2862bc	1439bc	49/97abc	9756 ab	630/3bcd	74/49a	51/5abc	8 ab	12/25bcd	57cd	60×20

2477 c	1214c	49/03abc	8499 abc	637/7bcd	74/52a	54abc	8/5 ab	14/31abc	58bc	60×25
2878bc	1378bc	47/5000c	7895 abc	858/3ab	75/08a	59ab	9 a	14/79ab	59ab	60×30
2700bc	1351bc	50/58abc	6721 bc	493/3de	74/63a	51/5abc	5/25c	11/56cd	55e	75×15
3286 ab	1631ab	49/65abc	8346abc	627/7bcd	74/82a	54 abc	5/75bc	12/54bcd	55/5e	75×20
3669a	1870a	49/97abc	11080a	847/7abc	75/25a	61 ab	7/5abc	14/28abc	56de	75×25
2548c	1311bc	51/67a	11320a	926/4a	75/10a	64/5a	7/75abc	15/75a	57cd	75×30

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