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EFFECT OF PLANTING DATES AND SEEDING RATES ON YIELD AND ITS QUALITY FOR TWO FLAX VARIETIES UNDER SANDY SOIL CONDITIONS

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ABSTRACT

Two field experiments were conducted, during the two consecutive seasons of 2002/03 and 2003/04, in the experimental Farm, Fac. of Agric. Fayoum Univ, El-Fayoum Governorate, to study the effect of three planting dates (30th Oct., 15th Nov., and 30th Nov.) and three seeding rates (40, 60 and 80 kg / fed) on the yield and quality of two flax varieties (Sakha 1 and Sakha 2). Split - split plot design with four replication was used.

The results indicated that highest yield and yield components were produced from sowing flax on 15th Nov., while the lowest values of these traits were produced from sown on 30th Nov. Increasing seeding rates from 40 to 80 kg seed / fed increased significantly plant height, technical stem length and seed oil percentage. In contrast, main stem diameter, straw yield / plant, number of capsules per plant, seed index and seed yield / plant were decreased by increasing seeding rate.

Sakha 1 variety recorded the tallest plant height, straw yield per plant and per fed, while Sakha 2 variety gave the highest number of capsules / plant, seed yield / plant as well as fed, seed index and oil percentage.

In general, it could be summarized that highest fiber and seed yields per unit area was recorded by Sakha 1 and Sakha 2 varieties, respectively, with increasing seeding rates from 40 to 80 kg seed / fed.

INTRODUCTION

Flax (*Linum usitatissimum* L.) is one of the oldest crop cultivated for its seed and fibers. Recently, it is necessary to increase flax productivity from the present limit area, this could be achieved by growing high yielding varieties or by improve agricultural treatments, i.e., sowing dates and seeding rates. The new reclaimed lands could be considered as the solution for increasing flax area.

Several investigators showed that flax plants were significantly affected by sowing date such as Salama (1996), Abd El-Daiem *et al.* (2002), Abd-El Haleem (2006), Abd El-Daiem *et al.* (2007) and Hussein *et al.* (2007).

With respect to seeding rates, Sorour *et al.* (1992), Abd El-Samie and Zedan (1998), Mosalem *et al.* (1999), Awad *et al.* (2001), Abu El-Dahab (2002), Abou-Zaid and El-Azzouni (2003) and Kineber (2003) reported that increase seeding rates caused an increment in the plant height, technical stem length, straw and seed yields / fed yield, meanwhile, the lower seed rate resulted in reduction of seed and straw yields / plant as well as their yield components.

Varietal differences among flax varieties has been studied by many investigators. Momtaz *et al.* (1990), Abd El-Daiem *et al.* (2002), Abd El-Haleem (2006) and Abo-Kaied *et al.* (2006). who found that Sakha 1

significantly surpassed Sakha 2 in technical stem length, while Sakha 2 produced the highest values of No. of capsules / plant, seed index and oil percentage.

MATERIALS AND METHODS

This study was done through execution of two field experiments during 2002/03 and 2003/04 seasons, in the Experimental Farm, Faculty of Agriculture, Fayoum University, El-Fayoum Governorate, Egypt.

Each experiment included 18 treatments represented the combination of two varieties, *i.e*., Sakha 1 and Sakha 2; three planting dates: early (D_1) 30th Oct.; intermediate (D_2) 15th Nov. and Late (D_3) 30th Nov. and three seeding rates, i.e., 40, 60 and 80 kg seed/ fed.

Statistical design was split- split plot with four replicates, where planting dates occupied the main plots, seeding rates distributed in sub-plot and the varieties located in sub-sub plots. The area of sub-sub plot was 6 m^2 (2x3 m) or 1/700 fed and the preceding crop in the two seasons was maize in both seasons. flax seed were sown broadcast. The normal practices of flax growing were practical. Physical and chemical analysis of the experimental plots are presented in Table 1.

Table 1. Mechanical and physical analysis of soil during 2002/03 and 2003/04 seasons .

Season	Sand	Silt	Clay	Texture
2002/03	71.9	3.4	24.7	Sandy clay loam
2003/04	66.2	3.4	30.4	Sandy clay loam

Cations and anions (meq / Kg soil), nitrogen (g/kg soil) EC. (m mhos) and pH of the experimental soil.

Grown	Cations				Anions					
season	Ca++	Mg++	Na+	K+	CO3=	HCO3-	CL-	N	EC	pH
2002/03	40.9	17.6	75.9	3.0	Nil	4.2	25.0	0.39	13.1	8.4
2003/04	39.8	19.9	73.9	3.6	Nil	3.0	23.0	0.29	13.0	8.3

At harvest time, ten guarded plants were taken from each sub-sub plot for measurements of yield components. Straw, seed and fiber yields / fed were estimated on the whole plot area basis.

I- Straw yield and its components:

Plant height (cm), technical length (cm), stem diameter (mm), straw yield / plant (g), straw yield / fed (ton).

II- Seed yield and its components:

Number of capsules / plant, seed index (1000-seed weight in gram), seed yield / plant (g) and seed yield / fed (kg).

III- Technological characters:

Long fiber percentage (= fiber yield per fed / straw yield per fed x 100); fiber fineness (Nm),in metrical number. It was determined by using Radwan and Momtaz (1966) according to the following formula: **Nm**= **N**x**L**/**G**

where: **Nm** = metrical number, **N** = number of fiber (20 fiber each 10 cm), **L** = length of fiber in mm and **G** = weight of fiber in mg and oil percentage was determined using the procedur described by A.O.A.C. (2000),using Soxhelt apparatus and petroleum ether with boiling range of 60-80^{o}C as solvent for six hours.

Statistical analysis:

Analysis of variance was computed according to Snedecor and Cochran (1982) and means were compared by least significant differences (LSD) at 5% level. Homogeneity test (Bartlett, test, 1937) was performed for error terms of each season before using combined analysis. Combined analysis was performed for all characters over two seasons according to (Le Clerg *et al.,* 1966).

RESULTS AND DISCUSSION

I- Straw yield and its components:

The mean values of straw yield and its components for two flax varieties as affected by planting dates and seeding rates from the combined analysis over two seasons are presented in Table 2. Analysis of variance showed significant differences among the averages for each of planting dates, seeding rates and two flax varieties under study in all straw characters. The results obtained revealed that the intermediate planting date at 15th November (D_2) achieved tallest plants (87.69 cm), technical length 74.97 cm, straw yield / plant (6.63 g) and straw yield / fed (3.50 ton) in comparison with the two other planting dates D_1 or D_3. It must be mentioned here, that delaying planting date until 30th of November (D_3) caused remarkable reduction in plant height, technical length, straw yield / plant as well as per fed, while stem diameter trait showed inconsistent trend in this case. Thereby, delaying of planting date did not permit for enough vegetative growth period, consequently low yield production had happened.

Table (2): Mean values of straw yield and its components for two flax varieties as affected by planting dates and seeding rates from the combined analysis over two seasons.

Planting dates	Seeding rates	Plant height (cm)			Technical length (cm)			Stem diameter (mm)			Straw yield /plant (g)			Straw yield / fed (ton)		
		Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean
D1	S1	82,21	79,27	**80,74**	69,91	68,39	**69,15**	2,22	2,13	**2,18**	1,67	1,61	**1,64**	3,33	3,31	**3,32**
	S2	89,13	83,91	**86,52**	74,73	72,47	**73,60**	2,08	1,98	**2,03**	1,59	1,52	**1,56**	3,45	3,40	**3,43**
	S3	90,14	86,15	**88,15**	76,36	74,19	**75,28**	2,01	1,96	**1,99**	1,44	1,40	**1,42**	3,50	3,44	**3,47**
Mean		**87,16**	**83,11**	**85,14**	**73,67**	**71,68**	**72,68**	**2,10**	**2,02**	**2,06**	**1,57**	**1,51**	**1,54**	**3,43**	**3,38**	**3,41**
D2	S1	85,61	83,19	**84,40**	72,18	71,69	**71,94**	2,31	2,23	**2,27**	1,81	1,75	**1,78**	3,43	3,39	**3,41**
	S2	89,14	86,33	**87,74**	75,95	74,49	**75,22**	2,11	2,07	**2,09**	1,63	1,59	**1,61**	3,51	3,46	**3,49**
	S3	92,61	89,27	**90,94**	78,38	77,13	**77,76**	2,04	2,01	**2,03**	1,52	1,46	**1,49**	3,66	3,52	**3,59**
Mean		**89,12**	**86,26**	**87,69**	**75,50**	**74,44**	**74,97**	**2,15**	**2,10**	**2,13**	**1,65**	**1,60**	**1,63**	**3,53**	**3,46**	**3,50**
D3	S1	81,93	80,35	**81,14**	69,79	69,48	**69,64**	2,17	2,09	**2,13**	1,61	1,55	**1,58**	3,36	3,31	**3,34**
	S2	85,24	82,21	**83,73**	72,86	70,67	**71,77**	2,07	1,99	**2,03**	1,48	1,44	**1,46**	3,47	3,42	**3,45**
	S3	88,14	85,17	**86,66**	75,15	73,33	**74,24**	2,99	1,95	**2,47**	1,43	1,40	**1,42**	3,52	3,47	**3,50**
Mean		**85,10**	**82,58**	**83,84**	**72,60**	**71,16**	**71,88**	**2,41**	**2,01**	**2,21**	**1,51**	**1,46**	**1,49**	**3,45**	**3,40**	**3,43**
S1		83,25	80,94	82,09	70,63	69,85	70,24	2,23	2,15	2,19	1,70	1,64	1,67	3,37	3,34	3,36
S2		87,84	84,15	85,99	74,51	72,54	73,53	2,09	2,01	2,05	1,57	1,52	1,54	3,48	3,43	3,45
S3		90,30	86,86	88,58	76,63	74,88	75,76	2,35	1,97	2,16	1,46	1,42	1,44	3,56	3,48	3,52
Mean		87,13	83,98	85,56	73,92	72,43	73,18	2,22	2,05	2,13	1,58	1,52	1,55	3,47	3,41	3,44

LSD 0.05	2,61	1,79	0,066	0,081	0,083
Planting dates (D)	3,06	2,56	0,215	0,113	0,076
Seeding rates (S)	2,21	0,66	0,153	0,042	0,048

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Concerning seeding rates effect, results pointed out gradual increment in plant height (82.09, 85.99 and 88.58 cm), technical length (70.24, 73.53 and 75.76 cm), stem diameter (2.19, 2.05 and 2.16 mm) which appeared to be closely nearer to another and finally straw yield / fed (3.36, 3.45 and 3.52 ton) for the seeding rates of 40, 60 and 80 Kg seed / fed. respectively. Moreover, the increase in either plant height or technical length associated with the increases in seeding rate due to more competition between plants which tended to elongate searching for light. On the other hand, straw yield / plant was decreased with increasing in seeding rates from 40 to 80 kg seed / fed., the respect means for this trait were 1.67, 1.54 and 1.44 g for the seeding rates at 40, 60 and 80 kg seed / fed., respectively. In spite of the reduction in straw yield / plant towards the highest seeding rate (80 kg seed / fed), the straw yield / fed was increased, by means that the more number of plants in this case compensate the low yield for each individual plant. These results are in agreement with obtained by Sorour *et al.* (1992), Mosalem *et al.* (1999), Awad *et al.* (2001), Abu El-Dahab (2002), Abou-Zaid and El-Azzouni (2003) and Kineber (2003).

The flax variety Sakha 1 superior over Sakha 2 in all straw characters with the respective mean values of 87.13 and 83.98 cm for plant height, technical length (73.92 and 72.43 cm), stem diameter (2.22 and 2.05 mm), straw yield / plant (1.58 and 1.52 g) and straw yield / fed (3.47 and 3.41 ton) for the two flax varieties previously mentioned, respectively. The differences between the two varieties due to the genetical make up for each one. Similar results were reported by Momtaz *et al.* (1990), Abd El-Daiem (2004), Abd El-Haleem (2006) and Abo-Kaied *et al.* (2006). The maximum averages obtained by Sakha 1 followed by Sakha 2 combined with the intermediate planting date (D_2) and highest seeding rate (S_3) in all five straw yield characters. All the interaction combinations had non significant effect on all straw yield characters, by means that each experimental factor done its effect free from the others.

II- Seed yield and its components:

The results in Table (3), illustrated the mean values of seed yield and its components for two flax varieties as affected by planting dates and seeding rates from the combined analysis over two seasons. Statistical analysis revealed that all the three factors under study significant differed in each mean values except with seed index as affected by seeding rates and seed yield / fed among two varieties did not reach the level of significance. The intermediate planting date (D_2) was the suitable time to obtained maximum estimates for No. of capsules / plant (6.56), seed index (9.87 g), seed yield / plant (0.49 g) and seed yield / fed (500.36 kg). Meanwhile, the lowest averages obtained when flax plants sowing at the first date (D_1) regarding all seed yield characters. These results are in agreement with those obtained by Salama (1996) Abd El-Daiem *et al.* (2002); Abd-El Haleem (2006), Abd El-Daiem *et al.* (2007) and Hussein *et al.* (2007).

Results indicated gradual decrement had occurred in No. of capsules / plant, seed index and seed yield / plant with increasing seeding rates from 40 up to 80 kg seed / fed. But seed yield / fed increased gradually with

increasing seeding rates, the mean values of this character were 437.71, 443.23 and 518.50 kg / fed for the seeding rates of 40, 60 and 80 kg seed / fed, respectively. These results are in agreement with obtained by Sorour *et al.* (1992), Mosalem *et al.* (1999), Awad *et al.* (2001), Abu El-Dahab (2002), Abou-Zaid and El-Azzouni (2003) and Kineber (2003).

The flax variety Sakha 2 surpass Sakha 1 in all seed characters with the averages of 5.98 and 6.31 for No. of capsules / plant, 8.83 and 9.82 g for seed index, 0.40 and 0.45 g for seed yield / plant, in addition to 457.74 and 475.22 kg / fed for seed yield / fed in relation to Sakha 2 and Sakha 1, respectively. Many investigators found varietal differences in seed characters such as Momtaz *et al.* (1990), Abd El-Daiem (2004), Abd El-Haleem (2006) and Abo-Kaied *et al.* (2006).

Table (3): Mean values of seed yield and its components for two flax varieties as affected by planting dates and seeding rates from the combined analysis over two seasons.

Planting dates	Seeding rates	No. of capsules/plant			Seed index (g)			seed yield/plant (g)			Seed yield / fed (Kg)		
		Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean
D1	S1	6,51	6,89	**6,70**	8,87	9,63	**9,25**	0,41	0,47	**0,44**	396,29	413,27	**404,78**
	S2	5,36	5,74	**5,55**	8,55	9,31	**8,93**	0,37	0,42	**0,40**	480,51	496,39	**488,45**
	S3	4,68	4,91	**4,80**	8,49	9,25	**8,87**	0,29	0,36	**0,33**	381,76	393,51	**387,64**
Mean		**5,52**	**5,85**	**5,68**	**8,64**	**9,40**	**9,02**	**0,36**	**0,42**	**0,39**	**419,52**	**434,39**	**426,96**
D2	S1	6,93	7,18	**7,06**	9,36	10,22	**9,79**	0,58	0,61	**0,60**	476,70	492,21	**484,46**
	S2	6,76	6,90	**6,83**	9,15	10,91	**10,03**	0,46	0,52	**0,49**	541,14	575,30	**558,22**
	S3	5,49	6,11	**5,80**	8,91	10,67	**9,79**	0,38	0,40	**0,39**	436,53	480,25	**458,39**
Mean		**6,39**	**6,73**	**6,56**	**9,14**	**10,60**	**9,87**	**0,47**	**0,51**	**0,49**	**484,79**	**515,92**	**500,36**
D3	S1	6,79	6,81	**6,80**	8,93	9,69	**9,31**	0,42	0,48	**0,45**	429,35	451,55	**440,45**
	S2	6,17	6,57	**6,37**	8,69	9,45	**9,07**	0,38	0,41	**0,40**	486,29	531,36	**508,83**
	S3	5,12	5,69	**5,41**	8,53	9,21	**8,87**	0,31	0,38	**0,35**	491,10	443,11	**467,11**
Mean		**6,03**	**6,36**	**6,19**	**8,72**	**9,45**	**9,08**	**0,37**	**0,42**	**0,40**	**468,91**	**475,34**	**472,13**
S1		6,74	6,96	6,85	9,05	9,85	9,45	0,47	0,52	0,50	434,11	452,34	443,23
S2		6,10	6,40	6,25	8,80	9,89	9,34	0,40	0,45	0,43	502,65	534,35	518,50
S3		5,10	5,57	5,33	8,64	9,71	9,18	0,33	0,38	0,35	436,46	438,96	437,71
Mean		5,98	6,31	6,15	8,83	9,82	9,32	0,40	0,45	0,43	457,74	475,22	466,48

LSD 0.05	0,792	0,768	0,082	31,280
Planting dates (D)	0,463	NS	0,068	22,540
Seeding rates (S)	0,281	0,816	0,043	NS
Varieties (V)				

The highest estimates obtained by Sakha 2 combined with D_2 in all seed yield traits and the seeding rate S1 for No. of capsules / plant (7.18) and seed yield / plant (0.61 g), while S2 for seed index (10.91 g) and seed yield / fed (575.30 kg) All the interaction combination had non significant effect on all seed characters under study.

III- Technological characters:

Estimates of some technological characters for two flax varieties as affected by planting dates and seeding rates from the combined analysis over two seasons in Table 4 . Analysis of variance illuminate significant differences between each of the mean values of planting dates and seeding rates in long fiber percentage and fiber fineness traits, but the two flax varieties were differed significantly in only fiber fineness character.

The intermediate planting date (D_2) achieved highest averages in long fiber percentages (13.60%), fiber fineness (208.76 Nm) and oil percentage (40.04%). On the contrary, lowest estimates obtained with delaying planting till the latest date (D_3) in the three technological traits under

study. These results are in agreement with obtained by Salama (1996), Abd El-Daiem *et al.* (2002), Abd-El Haleem (2006), Abd El-Daiem *et al.* (2007) and Hussein *et al.* (2007).

Regarding seeding rates effect, date disclose that the estimates of long fiber percentage and fiber fineness were increased gradually with increasing seeding rate from 40 towards the highest rate at 80 kg seeds / fed, but the oil percentage take the opposite direction, by means that insignificant reduction had happened with increasing seeding rate. Similar results were reported by Sorour *et al.* (1992), Mosalem *et al.* (1999), Awad *et al.* (2001), Abu El-Dahab (2002), Abou-Zaid and El-Azzouni (2003) and Kineber (2003).

The flax variety Sakha 1 ranked first and surpass Sakha 2 in fiber fineness character with the mean values for both in the some arrangement 217.23 and 188.08 Nm. But the differences between them concerning long fiber percentage and oil percentage did not reached the level of significance. Many investigators found varietal differences in these above-mentioned characters such as Momtaz *et al.* (1990), Abd El-Daiem (2004), Abd El-Haleem (2006) and Abo-Kaied *et al.* (2006).

Table (4): Mean values of some technological characters for two flax varieties as affected by planting dates and seeding rates from the combined analysis over two seasons.

Planting Dates	Seeding rates	Long fiber percentage (%)			Fiber fineness (Nm)			Oil percentage (%)		
		Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean	Sakha 1	Sakha 2	Mean
D1	S1	13,20	13,00	**13,10**	211,24	181,20	**196,22**	39,91	40,21	**40,06**
	S2	13,33	13,20	**13,27**	216,12	186,42	**201,27**	39,87	40,12	**40,00**
	S3	13,70	13,60	**13,65**	218,60	190,10	**204,35**	39,78	40,11	**39,95**
Mean		**13,41**	**13,27**	**13,34**	**215,32**	**185,91**	**200,61**	**39,85**	**40,15**	**40,00**
D2	S1	13,53	13,40	**13,47**	218,36	187,30	**202,83**	39,95	40,22	**40,09**
	S2	13,66	13,50	**13,58**	223,42	197,40	**210,41**	39,97	40,29	**40,13**
	S3	13,80	13,70	**13,75**	227,51	198,55	**213,03**	39,65	40,18	**39,92**
Mean		**13,66**	**13,53**	**13,60**	**223,10**	**194,42**	**208,76**	**39,86**	**40,23**	**40,04**
D3	S1	13,10	13,13	**13,12**	209,71	180,60	**195,16**	39,78	40,17	**39,98**
	S2	13,40	13,27	**13,34**	213,62	184,13	**198,88**	39,81	40,15	**39,98**
	S3	13,56	13,40	**13,48**	216,50	187,00	**201,75**	39,70	40,13	**39,92**
Mean		**13,35**	**13,27**	**13,31**	**213,28**	**183,91**	**198,59**	**39,76**	**40,15**	**39,96**
S1		13,28	13,18	13,23	213,10	183,03	198,07	39,88	40,20	40,04
S2		13,46	13,32	13,39	217,72	189,32	203,52	39,88	40,19	40,04
S3		13,69	13,57	13,63	220,87	191,88	206,38	39,71	40,14	39,93
Mean		13,48	13,36	13,42	217,23	188,08	202,65	39,82	40,18	40,00

LSD 0.05	0,22	8,73	NS
Planting dates (D)	0,18	6,41	NS
Seeding rates (S)	NS	9,85	NS
Varieties (V)			

The maximum estimates for long fiber percentage (13.80%) and fiber fineness (227.51 Nm) were obtained by the flax variety Sakha 1 combined with the intermediate planting date (D_2) and the highest seeding rate (S_3). While maximum oil percentage (40.29%) was recorded by Sakha 2 combined with D_2 and also S_2. All interaction combinations had non-significant effect on technological characters.

REFERENCES

A.O.A.C. (2000). Association of Official Analytical Chemist's. Official Methods of Analysis 17th ED., Washington, D.C., U.S.A.

Abd El-Dayem, M.A.; E.A. Maowed and M.M.M.Hussein (2007). response of sakha 2 flax variety to farmyard manure and plant density under different harvesting dates. J. Agric. Sci., Mansoura Univ., 32: 1583-1592.

Abd El-Dayem, M.A.; S.A.A. Shams and H.M.H. Abo-Kaied (2002). Effect of planting date and seeding rates on yield and its componts of flax *(Linum usitatissimum, L.)* grown under newly reclaimed land. Annals of Agric. Sci., Moshtohor, 40(2): 741-749.

Abd El-Haleem, R.A. (2006). Response of some flax varieties to plant density and Bio-Fertilization in sandy soils. M.Sc. Thesis, Fac. Agric. Moshtohor, Benha Univ.

Abd- El-Samie, F.S. and S.Z.A. Zedan (1998). Response of flax grown under newly reclaimed land to some agronomic practices. Fayoum. J. Agric.Res.& Dev. 12: 162-172.

Abo-Kaied, H.M.H; M.A. Abd El-Dayem and Afaf E. A. Zahana (2006). Variability and covariability of some agronomic and technological flax characters. Egypt J. Agric Res. 84: 1117-1132.

Abou-Zaid, T.A. and A.M.A. El-Azzouni (2003). Response of flax to soil leveling, planting methods and seeding rates. J. Agric. Sci., Mansoura Univ., 28: 6577-6589.

Abu El-Dahab, A.A. (2002). Effect of seeding rate on yield of some flax cultivars. J. Agric. Sci., Mansoura Univ., 27: 2005-2017.

Awad, A; A. M. Abd El-Wahab; H.M.Abd El-Mottaleb and M.M.M. Hussein (2001). Effect of seeding rate and nitrogenous fertilizer levels on flax; 2: Straw, seed and oil yields correlation and path analysis. Zagazig J. Agric. Res., 28:251-260.

Bartlett, M.S. (1937) Proc. Roy. Soc. Landon, 160: 268-282.

Hussein, M.M.M.; M.A. Abdel-Dayem, and Amany, M.M. El-Refaie (2007). effect of plant density and potassium fertilizer on yield and its quality of some flax genotypes under sandy soil conditions. J. Agric. Sci., Mansoura Univ., 32: 99- 115.

Kineber, M.E.A. (2003). Flax plants performance as influenced by planting methods and seeding rate. J.Agric.Res. Tanta Univ., 29: 64-73.

Le Clerg, E.L.; W.H.Leonard and A.G.Clark (1966). Field plot technique. Burgross Publishing Co. Minneapolis, Minnesata, U.S.A.

Momtaz, A.; M.El-Farouk, N. K. M. Mourad, T. Nasr El-Din, E.A.F. El-Kady and A. M. A. Hella (1990). New flax varieties, Giza 7 and Giza 8. Agric. Res. Rev., 68:1461-75.

Mosalem. M.E; A. El-Kady; S.H. Abo-Khadrah and W.M. El-Khoby (1999). Effect of planting methods, seeding rates and harvesting dates on yield and yield attributes of flax. J. Agric. Sci. Mansoura Univ., 24:933-1005.

Radwan, S.R. and A. Momtaz(1966): The technological properties of flax fibers and methods of estimating them. El- Felaha J. 46 (5): 466-476 (in Arabic) .

Salama, A.M. (1996). Influenced of planting date and nitrogen fertilizer levels on agronomic characteristics of three flax cultivars. J. Agric. Sci., Mansoura Univ., 21: 881-891.

Snedecor,G.W. and W.G. Cochran. (1982). Statistical Methods 7th edition, Iowa State Univ., Press. Ames., Iowa, U.S.A : 325 :330.

Sorour, S.R.; S.H.Abo-Khadrah; S.A. Youseef; E.A.El-Kady and A.A. El-Gazzar (1992). Effect of planting pattern and seeding rate on growth, yield and quality of some flax varieties. Pro. 5th Comf., Agron., Zagazig. (2): 836-850.

تأثير مواعيد الزراعة ومعدلات التقاوي على المحصول وجودته لصنفين من الكتان تحت ظروف الأرض الرملية

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أقيمت تجربتان حقليتان خلال الموسمين المتعاقبين ٢٠٠٢/٢٠٠٣ ، ٢٠٠٣/٢٠٠٤ بالمزرعة التجريبية بكلية الزراعة بالفيوم – محافظة الفيوم – جامعة الفيوم ، وذلك لدراسة تأثير ثلاثة مواعيد زراعية (٣٠ أكتوبر، ١٥ نوفمبر، ٣٠ نوفمبر) وثلاثة معدلات تقاوي (٤٠ ، ٦٠ ، ٨٠ كم/ فدان) على المحصول وجودته لصنفي الكتان سخا١، سخا٢. تم تنفيذ التجربة في تصميم القطع المنشقة مرتين ذات الأربع مكررات ، ويمكن تلخيص النتائج المتحصل عليها فيما يلي:

١-أشارت النتائج إلى أن أعلى قيم للمحصول ومكوناته قد تحصل عليها من الزراعة في ١٥ نوفمبر ، بينما أقل القيم كانت نتيجة التأخير في الزراعة حتى ٣٠ نوفمبر .

٢- كما أدى زيادة معدل التقاوي من (٤٠ إلى ٨٠ كيلوجرام / فدان) إلى زيادة معنوية في ارتفاع النبات ، والطول الفعال ، والنسبة المئوية للزيت . في حين انخفض سمك الساق الرئيسي ، ومحصول القش / نبات ، وعدد الكبسولات/نبات ، ودليل البذرة (وزن الألف بذرة بالجرام) ، وكذلك محصول البذرة / نبات .

٣-حقق صنف الكتان سخا١ أعلى قيم لارتفاع النبات ، ومحصول القش / نبات كما للفدان . بينما أعطى الصنف سخا٢ أعلى قيم في عدد الكبسولات / نبات ، ومحصول البذرة / نبات كما للفدان ، ودليل البذرة ، والنسبة المئوية للزيت .

٤-أظهرت النتائج أن كل التفاعلات (الأصنافx معدل التقاوي ، الأصنافx مواعيد الزراعة ، الأصنافx مواعيد الزراعة x معدل التقاوي) غير معنوية لكل الصفات تحت الدراسة.

وبصفة العموم يمكن التوصية بزراعة صنف الكتان سخا ١ للحصول علي محصول عالي من الألياف ، وزراعة صنف الكتان سخا ٢ للحصول علي محصول عالي من البذور مع معدل تقاوي ٨٠ كجم بذور / فدان.