

PERFORMANCE OF SOME FLAX VARIETIES (*Linum usitatissimum* L.) UNDER DIFFERENT SOWING AND HARVESTING DATES.

Kandil, A. A.* ; A. A. Lellah* ; T. A. Abou-Zaied and Heba A. Turky ****

*** Agronomy Dept., Fac. Agric., Mansoura University**

**** Fiber Crop Res., A.R.C**

ABSTRACT

Two field trials were carried out at El- Gemmeiza Agricultural Research Station, Garbia Governorate, during the two successive seasons 2006/2007 and 2007/2008. The objectives of this research was aimed to study the performance of some flax varieties i.e. Sakha 2, Sakha 3, Sakha 4 and Giza 8 under different sowing dates on 20th October, 10th November, 1st December and harvesting dates after 135, 150 and 165 days from sowing and their effects on straw yield and its component. The main findings could be summarized as follows.

Early sowing on 20th October significantly increased plant height, technical length and main stem diameter in the first season and straw yield/ plant , straw yield/ faddan in the second season, fiber yield/ faddan, fiber length and fiber fineness in both seasons. Sowing flax on 10th November significantly increased straw yield/ plant and straw yield/ faddan in the first season compared with the other sowing dates. Sowing flax on 1st December significantly decreased all studied straw characters.

Delaying harvesting date to 150 days from sowing significantly increased straw yield/ plant, fiber yield/ plant, fiber yield/ faddan. Delaying harvesting date to 165 day from sowing significantly increased plant height, technical length, fiber length, straw yield/ faddan and fiber fineness.

Sakha 3 variety surpassed the other varieties in plant height, technical length in the first season, fiber yield faddan and fiber length. Sakha 4 variety gave the tallest technical length in the second season and fiber yield/ plant in both seasons. Sakha 2 and Giza 8 varieties surpassed the other varieties in the straw yield/ faddan. Giza 8 superior other varieties in main stem diameter in both seasons.

It could be concluded that sown Sakha 3 or Sakha 4 early when shown early on 20th October and harvesting it after 165 days from sowing maximized straw/ fad and fiber fineness under the environmental conditions of Garbia Governorate.

INTRODUCTION

Flax (*linum usitatissimum*, L.) is still a major baste fiber crops in Egypt. It is known as long as pharaoh civilization and it is grown in large scale around the world. In northern region, it is grown as a fiber crop, in southern ones and cultivated as Mediterranean sea region. It is grown as a dual purpose crop for either fibers extracting from stems by retting after soaking in water .

In Egypt during the last few years, by releasing new varieties characterized by high yield ability and best quality in addition to improve different agricultural practices for this crop. With respect varietal differences, Abdel-Fatah (1994) and Kineber (1994) showed that straw yields as well as its components differed significantly among flax varieties, El- Kady (1995)

reported that varieties differed significantly in all straw characters of flax El-Deeb and Abdel-Fatah (2006) showed that genotypes differed significantly in plant height, technical length, straw yield/ faddan and fiber yield/ faddan.

According to sowing date, Salama (1996) reported that early planting date on 15th November significantly increased technical length, straw yield than the late planting date on first December, El-Deeb and Abdel-Fatah (2006) showed that early planting on 10th November significantly increased technical length, straw yield than the late planting date the first December Abd El Daiem (2009) reported that sowing date 10th November gave the highest straw yield, plant height, technical length, fiber length, straw yield/ faddan, fiber yield/ faddan and fiber fineness.

Harvesting date play a great role in fiber length and quality of flax as well as straw yield. In this respect, Mostafa (1990) reported that there was a continuous increase in straw yield as well as its components with delaying harvesting date from 130 to 170 days after sowing, except straw yield/ plant, which decreased significantly with delaying harvesting date to 170 days after sowing. Mohamed *et al.*(1998) showed that sowing on 9th Nov. and harvesting after 160 days from sowing was the suitable date to produce highest straw yield, El-Deeb and Abdel-Fatah (2006) showed that there was a continuous increase in straw yield as well as its components with delaying harvesting date from 130 to 165 days from sowing, except straw yield/ plant, which decreased significantly with delaying harvesting date.

The main objective of this work is aimed to determine the effect of sowing and harvesting dates on growth, yield and quality of four flax varieties i.e., Sakha 2, Sakha 3, Sakha 4 and Giza 8 under the environmental condition of Gahrpia district.

MATERIALS AND METHODS

The present investigation was carried out at El- Gemmeiza agricultural research station, Agric .Res. Center, Gharbia Governorate, Egypt, during the two successive seasons of 2006/ 007 and 2007/ 008. The objectives of this research was aimed to study the effect of sowing and harvesting dates on yield and its components of some flax (*linum usitatissimum*, L.) varieties i.e. Sakha 2, Sakha 3, Sakha 4 and Giza 8.

Three tested sowing dates on 20th October, 10th November and 1st December were conducted in separate split plot design with three replications for each sowing date. The main plot was devoted to the three harvesting dates at 135,150 and 165 days after sowing as shown in Table 1 The sub plots were assigned to the following four varieties Sakha 2, Sakha 3, Sakha 4 and Giza 8. The time of harvesting at the three studied sowing date are shown in Table 2.

Table (1): Time of harvesting dates at three studied sowing dates

Sowing date	Harvesting dates		
	after 135 days	after 150 days	after 165 days
20 th October	March 5	March 25	April 5
10 th November	March 25	April 10	April 25
1 st December	April 15	May 1	May 15

The pedigrees of the studied flax are varieties are listed in Table 2

varieties	Source
Sakha 2	Hera × 1.123
Sakha 3	(Belinka (2E) × 1.2096)
Sakha 4	(Belinka (R3) × 1.2569)
Giza 8	(Giza6 × Senta Catalina)

At each harvesting dates, ten guarded plants were taken at random from each sub- plot to be used in recording the straw yield component characters of flax. Flax yield for straw yield per faddan were recorded on the whole sub plot area basis the following straw yield and its components was determined.

- 1-Total plant height (cm). The length of main stem in cm from cotyledonary node to the top of plant.
- 2-Technical stem length(cm). The length of main stem in cm from cotyledonary node to the lowest branching zone.
- 3- Main stem diameter (mm)
- 4- Straw yield /plant.(gm).
- 5-Straw yield /faddan (ton).
- 6-Fiber yield plant (gm).
- 7-Fiber yield faddan (Kg).
- 8 Fiber fineness (Nm).
- 9- Fiber length(cm).

The obtained data for each planting date was statistically analysis separately by technique of analysis of variance thereafter , combined analysis for collected data of all sowing dates in both seasons were subjected to the statistical analysis according to the procedures outlined by Gomaz and Gomaz (1984). The treatment means were compared using the Newly Least Significant Difference (NLS D) test which developed by Waller and Dunckan (1969).

RESULTS AND DISCUSSION

Sowing date effects.

Results of straw yield and related characters for the three sowing dates results showed, had significant affected as shown in Tables 3 and 4. The results showed that plant height, technical length, main stem diameter, straw yield/ plant, fiber yield/ plant, straw yield faddan, fiber yield faddan, fiber length, and fiber fineness significantly affected by sowing dates. Sown on 10th November came in the second rank on straw yield/ plant and straw yield/ faddan in the first season only. The highest values in all straw characters were obtained with the early sowing date may be attributed to the suitable climate conditions i.e. the more favorable temperature, day length and the longer duration of the growth period. These results are in harmony with those obtained by Abou-Zaied(1991), Salam (1996), El-Deeb and Abdel-Fatah (2006) and Abd El Daiem (2009).

Harvesting date effects.

With respect to the effect of straw yield and its components, results in Tables 3 and 4 indicated that there were significant differences among the three harvesting dates on plant height, technical length, main stem diameter,

straw yield per plant, fiber yield/ fad, fiber length and fiber fineness in both seasons, fiber yield/ plant and straw yield/ fad in the second season only. The harvesting date after i.e. 165 days from sowing gave the tallest plants and technical length, fiber length and fiber fineness in both seasons. The highest values in stem diameter were recorded from early sowing after 135 days from sowing. These results are mainly due to the fact that plants did not reach their physiological maturity till 165 days from sowing and plants continued to increase in height consistently from 135 to 165 days old. These results are in agreement with those obtained by Sahrah *et al.* (1987), Shafshak *et al.* (1992), Esmail and Morsy (1996), El-Sweify *et al.* (1996), Mohamed *et al.* (1998), El-Deeb(1998), Amna *et al.* (2003) and El-Deeb and Abdel-fatah (2006).

Table (3): Means of plant height, technical length, main stem diameter and straw yield/ plant affected by sowing , harvesting dates and four varieties during both seasons.

Characters	Plant height (cm)		Technical length (cm)		Main stem diameter (mm)		Straw yield gm/ plant	
	Seasons		Seasons		Seasons		Seasons	
Treatment	2006/07	2007/08	2006/07	2007/08	2006/07	2007/08	2006/07	2007/08
Sowing dates (A)								
20 th October	94.4	98.3	82.8	88.5	2.30	1.56	1.29	1.05
10 th November	87.0	90.0	75.3	79.5	2.28	1.60	1.46	0.90
1 st December	65.8	79.0	52.5	71.1	1.93	1.98	1.04	0.76
F test	**	**	**	**	*	*	**	**
NLSD 0.05	0.6	0.8	0.7	1.6	0.10	0.07	0.07	0.04
NLSD 0.01	0.8	1.1	1.0	2.2	-	-	0.95	0.05
Harvesting dates (B)								
After 135 days	81.9	84.6	69.2	75.7	2.36	1.84	1.42	0.82
After 150days	81.9	89.9	69.9	81.2	2.17	1.76	1.25	1.03
After 165 days	83.3	92.9	72.4	82.2	1.87	1.55	1.13	0.86
F test	*	**	**	**	*	**	*	**
NLSD 0.05	0.7	0.8	0.7	1.7	0.10	0.08	0.07	0.04
NLSD 0.01	-	1.1	1.1	2.4	-	0.11	-	0.06
Varieties (C)								
Sakha 2	83.9	87.7	71.1	76.5	2.14	1.75	1.40	0.91
Sakha 3	84.0	89.4	72.2	80.2	2.17	1.73	1.12	0.83
Sakha 4	81.1	90.6	70.6	82.3	2.05	1.65	1.00	0.82
Giza 8	80.4	88.8	66.9	79.7	2.31	1.76	1.54	1.04
F test	**	NS	*	*	*	NS	**	*
NLSD 0.05	0.8	-	1.58	2.1	0.12	-	0.05	0.05
NLSD 0.01	1.1	-	-	-	-	-	0.07	-
Interaction F- test								
A X B	**	NS	*	NS	*	**	**	**
A X C	**	NS	**	**	*	**	**	**
B X C	NS	NS	NS	NS	NS	NS	NS	**
AX B X C	*	NS	NS	NS	NS	NS	*	**

Performance of varieties.

Results presented in Tables 3 and 4 indicated that mean of the four studied varieties i.e. Sakha 2, Sakha 3, Sakha 4 and Giza 8 were significantly differed in plant height, main stem diameter and fiber length only in the first season, technical length, straw yield/ plant and faddan, fiber yield/ faddan

and fiber fineness in both seasons. Sakha 3 variety ranked the first and reached maximum in plant height and fiber length in the first season only. Sakha 4 varieties ranked the first and reached maximum in technical length in the second only, Sakha 2 and Giza 8 varieties recorded maximum straw yield/ faddan in both seasons. The present results are mainly due to differences in the genetically structure of the varieties under study. These results are in harmony with those obtained by Abou-Zaied(1991), Mohamed *et al.* (1998), El-Shimy and Moawed (2000), El-Gazzar and Abou Zaied(2001), Mostafa and Ashmawy (2003), El-Deeb and Abdel-fatah (2006) and Abd El Daiem, (2009).

Table (4): Means of straw yield/ fad (kg), fiber yield / plant (gm), fiber yield/ faddan (kg), fiber fineness (Nm) and fiber length (cm) as affected by sowing, harvesting dates of some flax varieties during both seasons.

Characters	Straw yield ton/fad		Fiber yield gm/plant		Fiber yield kg/fad		Fiber length (cm)		Fiber fineness (Nm)	
	Seasons		Seasons		Seasons		Seasons		Seasons	
Treatment	Seasons		Seasons		Seasons		Seasons		Seasons	
Sowing dates (A)	2006/ 07	2007/ 08	2006/ 07	2007/ 08	2006/ 07	2007/ 08	2006/07	2007/08	2006/ 07	2007/ 08
Sowing dates (A)										
20 th October	3.161	3.039	0.22	0.16	487.0	514.0	74.7	78.0	273.8	274.4
10 th November	3.206	2.492	0.23	0.15	392.1	413.0	65.0	68.9	259.9	262.3
1 st December	1.408	1.305	0.15	0.12	213.4	194.6	44.1	62.4	234.6	232.0
F test	**	**	**	**	**	**	**	**	**	**
NLSD 0.05	0.040	0.010	0.02	0.01	5.4	4.6	1.4	0.7	3.9	1.1
NLSD 0.01	0.050	0.020	0.03	0.02	7.3	6.2	1.9	1.0	5.3	1.5
Harvesting dates (B)										
After 135 days	2.613	1.685	0.21	0.11	356.9	311.3	59.8	65.3	248.7	249.0
After 150days	2.591	2.540	0.19	0.16	386.8	411.7	60.2	70.8	257.8	257.6
After 165days	2.570	2.606	0.20	0.14	348.7	398.5	63.7	73.3	261.9	262.0
F test	NS	**	NS	*	**	**	**	*	**	**
NLSD 0.05	-	0.010	-	0.01	5.4	4.6	1.5	0.7	4.4	1.1
NLSD 0.01	-	0.020	-	-	7.3	6.2	2.2	-	6.3	1.5
Varieties (C)										
Sakha 2	2.889	2.463	0.19	0.12	385.6	335.4	60.5	63.1	239.3	239.3
Sakha 3	2.238	2.054	0.21	0.15	363.2	414.8	64.9	71.2	324.4	322.0
Sakha 4	2.351	1.933	0.19	0.153	361.6	369.3	63.4	75.6	317.9	320.6
Giz 8	2.888	2.664	0.20	0.14	346.2	375.8	56.3	69.2	142.9	143.0
F test	**	**	NS	*	**	**	**	**	**	**
NLSD 0.05	0.040	0.020	-	0.01	6.9	4.7	1.8	1.1	4.5	1.5
NLSD 0.01	0.050	0.030	-	-	9.2	6.2	2.4	1.5	6.0	2.0
Interaction F- test										
A X B	**	**	NS	*	**	**	NS	NS	*	**
A X C	**	**	**	**	**	**	*	**	**	**
B X C	**	**	NS	**	**	*	NS	NS	NS	NS
AX B X C	**	**	**	**	**	**	NS	NS	*	**

Effect of interactions:

The interactions between sowing and harvesting dates significantly affected straw yield only in the first season as presented in Table 5. The highest technical length was obtained from sowing on 20th October and

harvesting after 165 days from planting in the first season. The highest stem diameter values were obtained from early sowing flax on 20th October or 10th November and harvesting early after 135 days from sowing in both seasons. These results are in harmony with those obtained by Eassan *et al.*(1992) Mohamed *et al.* (1998) and El-Deeb and Abdel-Fatah (2006).

Results in Table 6 showed the interaction between sowing dates and studied varieties. The tallest technical length was obtained from sown Sakha 3, Sakha 2 and Sakha 4 varieties in both season. The highest main stem diameter values were obtained from sown Giza 8 on 10th November or 1st December in the first and the second seasons, respectively. The highest fiber length was obtained from sown Sakha 4 or Sakha 3 on 20th October in the second season without significantly differences between them. These results are in harmony with those obtained by El-Deeb and Abdel-fatah (2006) and Abd El Daiem, (2009).

Results in Table 7 showed the interaction between harvesting dates and studied varieties .The results clearly showed that technical length significantly affected by this interaction in both seasons. The highest technical length was obtained from harvesting for all studied varieties after 165 days from sowing without significantly differences between them. These results are in harmony with those obtained by Mostafa(1999), El-Deeb and Abdel-fatah (2006), Bozkurt and Kurt (2007) and Abd El Daiem, (2009).

The interaction between sowing and harvesting dates of the studied flax varieties significantly affected plant height, straw yield/ plant and faddan as presented in Table 8. The tallest plants were obtained by sowing flax Sakha 3 or Giza 8 varieties on 20th October and harvesting after 150 or 165 days from sowing, respectively without significantly differences between them in the first season. The heights straw yield/ faddan was obtained from sowing Giza 8 variety on 10th November and harvesting after 135 or 150 days from sowing in the first season. However, Giza 8 variety varieties when sown on 20th October and harvesting after 135 days from sowing in the second season. Heights straw yield/ faddan was obtained by Sakha 2 or Giza 8 varieties on 10th November and harvesting after 135 days from sowing in the first season, and by sowing Giza 8 variety on 20thOctober and harvesting after 165 days from sowing in the second season. These results are in harmony with those obtained by Mohamed *et al.* (1998), Jankauskien *et al.* (2001) and El-Deeb and Abdel-fatah (2006).

Results in Table 9 clearly showed that heights fiber yield/ plant was obtained by sowing Sakha 3 variety on 20th October and harvesting after 135 days from sowing in the first season. The height fiber yield/ plant was obtained by sowing flax Sakha 3 or Sakha 4 varieties on 20th October and harvesting after 150 days from sowing in the first season. The heights fiber yield/ faddan was produced from sowing Sakha 3 or Sakha 4 varieties on 20th October and harvesting after 150 days from sowing in the first season, while the highest fiber yield/ faddan was obtained by sowing Sakha 3 variety on 20th October and harvesting after 165 days from planting in the second season. These results are in agreement with those obtained by El-Deeb and Abd- El Fatah (2006).

Results in Table10 clearly showed that the highest fiber fineness was obtained by sowing Sakha 3 or Sakha 4 varieties on 20th October and harvesting after 165 days from sowing in both seasons. These results are in harmony with those obtained by El-Deeb and Abdel-fatah (2006).

Table (5): Means of technical length, main stem diameter (mm) and fiber length(cm) as affected by the interaction between sowing × harvesting dates during 2006/ 2007 and 2007/ 2008 seasons.

Characters	Technical length (cm)			Main stem diameter(mm)					
	2006 / 2007			2006 / 2007			2007/ 2008		
Treatments	20 th	10 th	1 st	20 th	10 th	1 st	20 th	10 th	1 st
Harvesting dates	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec
After 135 days	81.9	71.9	53.9	2.61	2.56	1.90	1.88	1.91	1.77
After 150 days	82.8	75.5	48.9	2.36	2.22	1.92	1.59	1.60	2.06
After 165 days	83.8	78.6	54.8	1.92	2.04	1.96	1.21	1.28	2.14
F test	*			*			**		
NLSD 5%	1.3			0.18			0.14		
NLSD 1%	-			-			0.20		

Table (6): Means of technical length, main stem diameter (mm) and fiber length (cm) as affected by the interaction between sowing dates × varieties during 2006/ 2007 and 2007/ 2008 seasons.

Characters	Technical length (Cm)						Main stem diameter(mm)						Fiber length(cm)					
	2006 / 2007			2007/2008			2006 / 2007			2007 / 2008			2006/2007			2007/2008		
Varieties	20 th	10 th	1 st	20 th	10 th	1 st	20 th	10 th	1 st	20 th	10 th	1 st	20 th	10 th	1 st	20 th	10 th	1 st
	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec	Oct	Nov	Dec
Sakha 2	83.2	73.9	56.3	79.8	80.1	69.5	2.40	2.18	1.86	1.66	1.60	1.99	72.9	62.5	46.3	65.5	65.8	57.9
Sakha 3	86.8	78.6	51.2	89.4	80.8	70.5	2.33	2.13	2.06	1.85	1.36	1.98	80.7	68.1	45.9	80.8	71.3	61.6
Sakha 4	84.3	76.2	51.3	92.6	82.5	71.9	2.18	2.17	1.79	1.37	1.69	1.89	79.7	65.8	45.3	86.5	74.9	65.6
Giza 8	77.1	72.7	51.0	92.1	74.8	72.4	2.30	2.61	2.00	1.37	1.76	2.06	66.3	63.6	48.9	79.4	63.6	64.5
F test	**			**			*			**			*			**		
NLSD 5%	3.4			3.7			0.22			0.20			4.3			2.1		
NLSD 1%	4.2			5.0			-			0.30			-			2.8		

Table (10): Means of fiber fineness (Nm) as affected by the interaction between sowing dates varieties during 2006/2007 and 2007/2008 seasons.

Characters		Fiber fineness (NM)					
Treatments		Sowing dates/ 2006/2007			Sowing dates/ 2007/2008		
Harvesting date	Varieties	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec
After 135 days	Sakha 2	239.2	224.4	214.9	237.3	223.7	215.6
	Sakha 3	335.9	311.3	304.6	335.7	316.4	302.8
	Sakha 4	313.8	308.6	313.6	315.0	307.1	315.6
	Giza 8	151.6	162.5	103.6	152.3	162.5	103.9
After 150 days	Sakha 2	246.6	264.0	215.3	256.1	267.5	213.0
	Sakha 3	354.1	310.7	307.9	337.2	312.4	306.6
	Sakha 4	335.7	315.7	313.6	336.4	311.7	313.6
	Giza 8	154.9	169.6	105.1	157.9	177.5	101.8
After 165 days	Sakha 2	266.5	267.9	215.4	273.4	261.9	205.4
	Sakha 3	363.7	324.4	306.8	363.2	322.6	301.2
	Sakha 4	362.0	285.3	312.3	361.2	319.2	305.0
	Giza 8	162.0	173.8	102.6	167.3	164.9	99.3
F Test		*			**		
NLSD 0.05		19.8			5.1		
NLSD 0.05		-			6.9		

Conclusion:

It Could be concluded that sowing flax Sakha 3 or Sakha 4 varieties on 20th October and harvesting after 150 or 165 days maximizing straw yield and fiber yield and its components

REFERENCES

- Abd El Daiem, M.A. (2009). Resonse of some flax genotypes to sowing dates and micro elements fertilization. Ph.D. Thesis, Fac. Agric., Al-Azhar Univ.
- Abdel-Fatah, A.A.E (1994). Agricultural studied on flax crop .M. Sc. Thesis, Fac., Agric., Kafr El-Shelik, Tanta Univ., Egypt.
- Abou-Zaied, T.A.(1991). Agronomic studies on flax (*Linum usitatissimum* L.) M. Sc. Thesis Fac. Agric., El-Mansoura Univ .Egypt.
- Amna, H.H.E ; M.A. Tag el Din and H.A.M. Sharaf El- Deen (2003). Effect of some flax genotypes and harvesting dates on seed chemical composition, yield and fiber quality. Moshtohor Annals of Agricultural Science, 41(1): 19-37
- Balasz, F ; M. Doucet and G.G. Popirlan (1989). Influence of sowing date on the yields of fiber flax in eastern Transylvania. Probleme de Agro fitotehnie Teoretica Si Aplicata., 11(2): 183-197.
- El-Deeb, E.A. and A.A.Abd El Fatah (2006). Effect of sowing and harvesting dates on yield and its quality for some flax varieties. J. Agric. Sci. Mansoura Univ., 31(9): 555-5566.
- El-Deeb,E.A.(1998) Response of some flax varieties to phosphatic fertilizer and harvesting dates .M. Sc. Thesis , Fac . Agric .,Moshtohor , Zagazig Univ.

- El-Kady, E.A.F ; S. E. Shafshak ; F. I. Gab-Allah and M. E. A. Kineber (1995). Effect of seeding rates on yield and its components of six promising flax genotypes under saline conditions. J. Agric. Sci. Mansoura Univ., 20(2): 593-602.
- El-Shimy, G.H. and E. A. Moawed (2000). Effect of different potassium and nitrogen fertilizer levels on Giza 8 and Viking flax varieties. J. Agric. Sci. Mansoura Univ., 25 (10): 5993- 6007.
- El-Sweif, A.H.H. ; E.A.F. El- Kady and S.M. Gaafar (1996). The influence of harvesting times and row spacing on the quantity, quality, and chemical composition of some flax cultivars. J. Agric. Sci. Mansoura Univ., 21 (10): 3421-3428.
- Esmail, S. E., and M.R. Moursi (1996). Flax plants performance as influenced by seeding rate and harvesting date and their response curves. Mansoure Univ., J. Agric. Res., 19(5): 3421- 3428.
- Easson, D.L. and F.N.Long (1992). Effect of time of sowing, seed rate and nitrogen level on fiber and quality of flax (*Linum usiatatissimum L.*) Irish J. Agric. And food Res.,31(2):163-172.
- Gomaz, K.A. and A.A. Gomaz (1984). Statitistical procedures for agricultural researches. John Wiley and Sons. Inc. New York, 2nd Ed.,68 p.
- Jankauskiene, Z. and S. Mikelionis (2001). The influence of fibre flax varieties' ripeness and harvesting method on fiber output and quality. Zemdirbyste, Mokslo Darbai. 2001; 76: 47-54.
- Kineber, M.E.A (1994). Evaluation of some new promising flax varieties strains under soil condition. Ph.D. Thesis, Fac. Agric. Moshtohor, Zagazig Univ., Egypt.
- Mohamed, A.A.E ; M.E.A. Kinber and E.A.F.El-Kady (1998) Effect of sowing and harvesting date on yield of flax genotypes . J. Adv. Agric.Res Alex-Saba-Basha, 3 (1): 31-42
- Mostafa, S.H.A (1990). Response of flax to seeding rate and harvesting time .M. Sc. Thesis, Fac. Agric., Mosthohor, Zagazig Univ. (Banha Branch).
- Mostafa, A.S. (1999). Comparative studies between some new flax lines and commercial variety Giza 7 M.SC. Thesis Fac, Agric, Mansoura Univ.
- Mostafa, S.H.A and F. Ashmawy (2003). Comparative study for traits of some flax genotypes using factor and cluster analyses Moshtohor, Egypt: Faculty of Agriculture, Zagazig University. 41(1): 1-18
- Mostafa, S.H.A (1990). Response of flax to seeding rate and harvesting time .M.Sc. Thesis ,Fac. Agric., Mosthohor, Zagazig Univ.(Banha Branch).
- Salama, A.M.(1996). Influence of planting date and nitrogen fertilizer levels on agronomic characteristics of three flax cultivars. J. Agric. Sci. Mansoura Univ., Egypt. 21 (3): 881- 891.
- Sahsah ,A.I ; A. Hella and S.M. Gaafar (1987). Effect of harvesting dates on growth , yield and its quality of flax (*Linum usiatatissimum L.*). Ann Agric. Sci., Moshtohor, 25(3):1171-1181.
- Waller, R.A. and D.B. Dunckan (1969). Abays rule for the symmetric multiple comparison problem. J. Amer. Assoc., 64: 1484-1503.

سلوك بعض أصناف الكتان تحت تأثير مواعيد الزراعة و الحصاد المختلفة
احمد أبو النجا قنديل*، عبد الرحيم عبد الرحيم ليلة*، طه عبد المنعم ابو زيد** و
هبة عبد الحليم تركي**
* قسم المحاصيل - كلية الزراعة - جامعة المنصورة .
** قسم محاصيل الألياف - مركز البحوث الزراعية.

أقيمت تجربتان حقليتان بمحطة البحوث الزراعية بالجميزة - محافظة الغربية خلال
الموسمين الزراعيين ٢٠٠٦/٢٠٠٧ و ٢٠٠٧/٢٠٠٨ . وتهدف هذه الدراسة إلى دراسة
تأثير ثلاثة مواعيد للزراعة (٢٠ أكتوبر و ١٠ نوفمبر و الأول من ديسمبر) و ثلاثة مواعيد
الحصاد (الحصاد بعد ١٣٥ و ١٥٠ و ١٦٥ يوم من الزراعة) على محصول القش ومكوناته
وجودة الألياف لأربعة أصناف من الكتان (سحا ٢ و سحا ٣ و سحا ٤ و
جيزة ٨).

ويمكن تلخيص أهم النتائج التي تم التوصل إليها كما يلي:-

- ١ - أشارت النتائج أن لمواعيد الزراعة تأثيرا معنويا على جميع الصفات تحت الدراسة
وان الزراعة في ٢٠ أكتوبر أدت إلى زيادة معنوية في الصفات الطول الكلي والطول
الفعال و محصول القش للقدان وطول الألياف و وزن ليفه النبات و وزن ليفه القدان
ونعومة الألياف بينما أدت الزراعة في الميعاد الأخير وهو الأول من ديسمبر إلى
نقص معنوي في كل الصفات المدروسة.
- ٢- أوضحت النتائج أن لمواعيد الحصاد تأثيرا معنويا على جميع لصفات المدروسة
ويختلف ميعاد الحصاد الأمثل باختلاف مواعيد الزراعة فعند الزراعة في الميعاد
المبكر وهو ٢٠ أكتوبر و ١٠ نوفمبر كان انسب ميعاد للحصاد هو ١٦٥ يوم من
الزراعة .
- ٣- أظهرت النتائج أن الأصناف تحت الدراسة تختلف معنويا في كل الصفات المدروسة
وأوضحت النتائج وتفاوت الصنفين سحا ٢ و جيزة ٨ في محصول القش للقدان.
- ٤- أظهرت النتائج أن للتفاعل بين مواعيد الزراعة و مواعيد الحصاد والأصناف تأثيرا
معنويا في معظم الصفات التالية الطول الكلي و وزن قش النبات و وزن قش للقدان و
وزن الألياف النبات و وزن الألياف للقدان و نعومة الألياف.

توصى هذه الدراسة بزراعة صنف سحا ٣ أو سحا ٤ في ٢٠ أكتوبر والحصاد
بعد ١٦٥ يوم من الزراعة للحصول على أعلى إنتاجية من محصول القش بوحدة المساحة
تحت ظروف الأراضي بمحافظة الغربية

قام بتحكيم البحث

كلية الزراعة - جامعة المنصورة
كلية الزراعة - جامعة طنطا

أ.د / على السعيد الشريف
أ.د / السيد حامد الصعدي

Table (8): Means of plant height (cm), straw yield/ plant, straw yield/ faddan as affected by the interaction between sowing dates, harvesting dates and varieties during both seasons.

Characters		Plant height (cm)			Straw yield gm/ plant						Straw yield ton/ faddan					
Treatments		Sowing dates 2006/2007			Sowing dates 2006/2007			Sowing dates/ 2007/2008			Sowing dates/ 2006/2007			Sowing dates/ 2007/2008		
Harvesting dates	Varieties	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec
After 135 days	Sakha 2	92.8	84.7	71.4	1.57	2.08	1.02	1.47	0.99	0.72	2.980	3.803	1.700	2.770	1.343	1.307
	Sakha 3	95.2	86.9	71.1	1.70	1.48	0.92	0.56	0.66	0.49	2.687	2.800	1.610	2.720	1.097	0.840
	Sakha 4	92.9	82.3	68.4	1.14	1.26	0.95	0.57	0.59	0.38	2.967	2.710	1.633	2.210	1.227	0.947
After 150 days	Giza 8	91.7	81.5	64.6	1.51	2.32	1.07	1.56	1.27	0.62	3.067	3.513	1.890	2.740	1.410	1.610
	Sakha 2	92.8	88.0	72.7	1.50	1.47	1.07	1.09	0.68	0.84	3.747	3.477	1.643	2.867	3.360	2.217
	Sakha 3	96.6	89.0	65.2	1.10	1.07	0.95	1.31	0.94	1.08	2.763	2.700	0.653	2.677	2.637	1.073
After 165 days	Sakha 4	94.5	88.2	57.6	1.07	1.01	0.96	1.35	1.31	0.70	3.207	2.763	1.143	2.590	2.797	0.980
	Giza 8	94.5	84.2	59.3	1.24	2.09	1.45	1.43	0.91	0.70	3.603	3.570	1.820	3.313	3.687	2.350
	Sakha 2	94.6	90.1	69.0	1.22	1.33	1.31	0.81	0.67	0.96	3.537	3.780	1.330	3.617	3.407	1.283
After 165 days	Sakha 3	95.9	91.3	64.3	0.95	1.00	0.93	0.81	0.96	0.70	2.870	2.030	1.027	3.663	2.823	0.957
	Sakha 4	94.2	91.6	60.2	0.94	0.84	0.82	0.71	0.94	0.80	2.870	2.773	1.097	3.127	2.753	0.770
	Giza 8	96.5	85.9	65.5	1.51	1.64	1.04	0.93	0.89	1.06	3.637	3.550	1.343	4.177	3.360	1.330
F Test		*			*			**			**			**		
NLSD 0.05		3.4			0.25			0.18			0.152			0.090		
NLSD 0.01		-			-			0.23			0.199			0.119		

Table (9): Means of fiber yield/ plant(gm) and fiber yield/ faddan(kg) as affected by the interaction between sowing dates, harvesting dates and varieties during both seasons.

Characters		Fiber yield gm / plant						Fiber yield kg/ faddan					
Treatments		Sowing dates/ 2006/2007			Sowing dates/ 2007/2008			Sowing dates/ 2006/2007			Sowing dates/ 2007/2008		
Harvesting dates	Varieties	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec	20 th Oct	10 th Nov	1 st Dec
After 135 days	Sakha 2	0.18	0.20	0.15	0.12	0.09	0.10	441.6	421.6	219.1	436.3	201.0	167.0
	Sakha 3	0.33	0.19	0.19	0.10	0.13	0.08	328.0	351.4	343.9	595.0	298.8	161.4
	Sakha 4	0.23	0.27	0.14	0.11	0.11	0.11	402.4	396.3	321.2	501.5	245.3	176.0
	Giza 8	0.21	0.28	0.14	0.15	0.15	0.09	428.5	390.2	238.6	536.2	201.1	216.0
After 150 days	Sakha 2	0.22	0.15	0.17	0.15	0.13	0.12	562.9	438.0	232.6	403.8	461.1	266.8
	Sakha 3	0.17	0.25	0.16	0.23	0.19	0.17	570.8	441.7	206.2	492.8	605.6	238.0
	Sakha 4	0.13	0.27	0.18	0.24	0.17	0.11	559.3	394.4	176.9	477.8	555.0	172.9
	Giza 8	0.27	0.19	0.11	0.19	0.15	0.10	528.2	323.8	207.0	456.0	513.5	296.7
After 165 days	Sakha 2	0.27	0.24	0.14	0.13	0.10	0.11	539.8	440.3	174.4	484.30	435.9	163.0
	Sakha 3	0.19	0.24	0.14	0.14	0.17	0.13	507.7	361.5	157.6	664.9	509.0	167.5
	Sakha 4	0.16	0.22	0.15	0.13	0.21	0.16	506.2	361.7	135.7	565.0	497.2	133.2
	Giza 8	0.26	0.26	0.12	0.17	0.16	0.14	468.6	383.8	147.4	554.1	431.9	176.3
F Test		**			**			**			**		
NLSD5%		0.07			0.03			20.8			15.1		
NLSD 1%		0.09			0.04			27.5			19.9		

