Evaluation of the effect of sowing date on grain and oil yield and yield components of three Canola genotypes in aleshtar.

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Abstract
The aim of planting date effect on yield and yield component of Canola (Brassica napus L.)atest is done as a factorial and formulation of complete random bloks with four repetions in 2005 – 2006 in the zone of Alashtar. testing factor : plantation date in three levels : (13 and 23 Sep , 3 Oct) and digit in three levels in cultivars Opera , Okapi and Licord . the results showed that the planting date had significant effect on pod per plant and seed oil (%) the varieties effect on pod per plant and 1000 seeds weight were significant .In general at first and second plantation date , the average of Opera was 4138,3701 kg/ha in third plantation date tge average of Licord was 3678 kg/ha.

Key words: Aleshtar , Brassica Napus L., Cultivars, planting date, seed yield.

Abstract
The oil seeds are consider as the seconder source of food for the worlds people.(3). Since the 20 th century fifth decade, there have been preparations to make great changes in Canola genetically , in a way that some specialist believe that hybrids and new varieties are more desirable than improvements in terms of oil from sunflower and residus from soybean (2). Aeeneh band (1) reported that the plantation date and varieties had no significant effect on the rate of the available seeds within bag, but the plantation date had a significant effect on the 1000seed weights. The maximum range of the 1000seed weights was obtained during plantation dates as soon as possible. The effect of the plantation date on the seed yield and the number of the bage in bushes and also the percentage of the seed oil was very significant (1). Terling (14) showed that inappropriate plantation date, the number of bpods-producing branches in bushes all reduce the canol seed yield. Scarisbrisk et, al(12) concluded that the deluy in plantation date decreases the 1000 seed weight and the oil magnitude. Also, it generally reduces the seed yield through the decrease in the harvest index of the plant amount and the number of secondary branches in the bush.Johanson et, al (8) compared the effect of varying plantation dates of canola and concluded that the delay in plantation date reduces the seed yield . Reduction in seed yield in late plantation dates induced by low number of pods in plant and harvest index reduction . That was consistent to the findings by song et al(13) and Mc kay etal(10). Barszczak et al (7) , Topin kaetal (15) reported that the delay in plantation date has caused the plant to not reach to the suitable Roset in early winter , thereby the damaged binding tissue or root has been removed because of the damaged cold.Ahmed (6) showed that the number , of bags in plant has been affected by latency. He observed that latency is undesivable for plants. As it reduces the number of bags in the plant -ShiranRad(5) investigating the effect of the plantation date and the bush density on the growth trend and the agricultural attributes of the fall canola varietis , showed that the delay in plantation reduces

bush height ,the number of seed in pod, 1000 seed oil percentage.(5)Mc Gregore (9) stated that the canola single plant yield is determined by the number of seeds in bag , the number of bag in bush and the seed weight. Of the individual seed yield componts of this plant , the number of bag in bush showed the highest impressionability of the environment , thats it had the highest effect on the seed yield . whitfild (16) and Raymer(11) stated that increasing temparaure in the stage of seed fulfilling , the pods breath rates in crease rapidly and this dissipates treated juice excessively. Therefore seeds don't receive sufficient nutrition and the number of empty seeds increase.

Material & Methods

This research had been conducted in 2005-2006 in Aleshtar city at a field about 1500m2 which had been under fall wheat cultivation last year. The experiment was performed as a factorial in a form of complete random block plan with 4 repeatitions: The elements to test to test included : the plantation date (D) in 3 levels (13 and 23Sep , 3Oct) and variety(7) also in three levels (Opera , Okapi, Licord). The field preparation process included: Plough, the application of the trifloralin herbicide by 2/5 lit in hectare along with 2 times Disk proportional to each other to mix with soil and using trowel the field was flat. Before the experiment, the soil physicochemical properties were determined and it was specified that the site soil had aloom-general-silt tissue with a pH between 7/8 to 8. Nitrogenous, photasium and phosphate fertilizers were used based on manual drying in high density and in a depth of 2cm. Each plot included 6 plantation lines in a distance of 25cm lines and a length of 6m lines. Blocks were placed in a 3m distance from each other. After seed cultivation, The field had been irrigated in concerned dates immediately. In order to determine proper bush density the field had been narrowed in tow leaf steps of 4 and 6. Bush density was regulated based on80 bushes in m^2.this distance reached 5cm for bushes on each plantation row. During growth period, the essential agricultural protections were applied such as using super galant herbicide to control narrow-leaf weeds and also Acatin and primor toxins to control aphid. To determine some attributes such as the number of bags in bush and the number of seed in bags, 10 bushes in each plot were selected and measured from 4 median lines –seed yield had been calculated based on 12% moisture and in Kg/hectare. Using seed counting device, a lot of 1000 seeds were separated from harvested seeds in each experimental plot (based on 12% moisture), after balancing with sensitive scale ,the resulting number was served as 1000 seeds weight, to determine seed oil percentage the suckseleh method was used. After sampling and note taking in the field and using lab to determine oil amount, finally the SAS,MSTATC software was used to analyze data and compare averages in Duncan multi range testing method.

Results and discussion

The number of bag in bush: the effect of plantation date on the number of bag in bush was significant at5%. (table1). The first plantation date with average 335/5 had the highest number of bag in bushes (table 2). The effect of cultivar on the number of bag in bush was significant at 5% (table 1) that is Licord cultivar with 337/1 mean number and Okapi: with 265/6 mean number produced the highest and lowest number of bags in bush respectively (table 2). The interaction of the plantation date and variety on the number of bag in bush wasn't significant.(table1) but the cultivar Opera had the highest and lowest number of bag in bush in third and second plantation dates with the averages 430/4 and 257 numbers respectively. Generally the cultivar Opera in first and third plantation dates with 319/1 and 430/4 average numbers and cultivar Okapi in second plantation date by 280/6 average

number had the highest number of bags in bushes (table 3). The number of bag in bushes decreased as the flower fall rates increased during insemination or after that. In other words, plant removes some of the formed flowers physiologically because of the balance between photosynthetic material, the breath rate and material storage. So these elements reduce the number of bags in bushes in late plantation date.

The number of seed in bag the effect of plantation date on the number of seed in bag wasn't significant (table 1). But third plantation date by 22/53 mean number had the highest number of seed in bag (table 2). The effect of cultival on the number of seed in bag wasn't significant (table 1) .But cultival Okapi by 22/87 mean number and Opera by 21/48 mean number produced the highest and lowest numbers of seed in bags respectively (table 2). The interaction of the plantation date and cultivar wasn't significant (table 1), but Licord in the second plantation date and Okapi in third plantation date had the highest and lowest number of seed in bags by 22/25 and 21 mean number respect

In total, at the first date, Okapi with 22/25 and at second and third vely Dates, Licord with 24/55 and 21/83 numbers produced the highest number of seed in bag (table 3).As the yield component affect each other and increase or decrease in each component is effective for others. (4). It seems that the higher number of pods in early plantation date has caused the plant to face problem in seed first date of formation as result the number of seed in bags has decreased.1000seed weight : The effect of plantation date on 1000 seed weight was significant (table 1). But the first plantation date by 4/650g, had the highest seed weight (table 2). The effect of the cultivar on the 1000 seed weight was significant at 1% (table 1) such that Opera by 4/958g and licord by 4/225g averages generated the highest and lowest1000 seed weight (table 2).The interaction of plantation date and cultivar wasnt significant (table 1). But Licord at first plantation date with 5/050g and at the third date by 4/200g produced the highest and lowest number of 1000 seed weight. Generally at the first date, Licord by 5/050 mean and at the second and third dates, Opera by 4/650 and 4/352h produced the highest weight of 1000 seed (table 3). At late plantation date, the Canola cant use environmental conditions (radiation, temperature, carbon dioxide). Sufficiently to synthesis and treated juice production. In a addition, during seed fulfilling period, the plant becomes heavy on one hand, and its weakening on the other hand cause bush lying and plant can't return back to the original state again. As a consequence, they don't get sufficient light and their synthesis activity decrease and little amount of juice reach the seed, so seeds become light and the 1000 seed weight decreases-seed yield: The effect of plantation date on the seed yield wasn't significant (table 1). But the first date by average 3683kg generated the highest rate of seed yielding (table 2). The effect of cultivar on the seed yield wasn't significant (table 1).But Opera by 3899kg mean and Licord by average 3276kg in hectare generated the highest and lowest seed yield respectively.(table 2). The interaction of plantation date and cultivar wasn't significant(table 1). but Opera at first date by 4138kg and at the second date by 3211kg in hectare had the highest and lowest seed yield respectively. Totally at first and second dates, Opera cultivar by 4138,3701kg in hectare generated highest seed yield(table 3). At suitable plantation date, the Canola is able to achieve desired size in terms of the leaves number, dry weight and root length before winter and eaters transitional winter stage with strong Roset and passes it well. Thus, after coldness it develops rapidly and reaches the desived leaf index and uses environmental conditions sufficiently to perform synthesis and produces treated juice. In late plantation date it encounters the high temperature and dried strain during bag loadings and this reduces treated juice production and shorten seed loading and its rapid ripenss. These elements reduce seed yield .

The seed oil percentage The effect of plantation date on the seed oil percentage was significant at %1 (tabel1), such That the third date of plantation by average 54/40% had the highest seed oil percentage (tabel 2).

The effect of culticultivar on the oil percentage wasn't significant (tabel1), but cultivar Okapi by average 44/96% and Licord by 44/32% respectively both generated lowest seed oil percentage .The interaction of plantation date and cultivar wasn't significant (tabel1).But Licord at third date by 49/97% and Okapi at the same date by 43/40% had the highest and lowest seed oil percentages respectively (table 3). In general, at first, second and third plantation dates, the licord cultivar generated the highest seed oil percentage by averages 44/8 0, 45/42, 45,97% respectively . Although the rate of seed oil is an attribute with high heritage , but it partially affected by environmental conditions. In proper plantatiou ,thseedloadiny period and seed ripeniny area com paying with mild temperature deyree .and it has sufficient opportunity for ripening and loadiny, soits oil amount in increases-seed oil yield. The effect of plantation date on the seed oil yield wasn't significant (table1)

But the first date by average 1629 kg in hectare, had the highest rate of the seed oil yield (table2) . the effect of the cultivar on the seed oil yield was significant(table1), but Opera by average 1738 Kg in hectare and Licord by average 1502 kg generated the lowest seed oil yield (table 2).The interaction of plantation date and cultivar wasn't significant, but Opera in first date by average 1835 kg had the lowest seed oil yield, Generally in first date, Opera cultivar by average 1835 kg and by averages 1649 and 1609 kg generated the highest rate of seed oil yield (table 1,3). The results of this research showed that delay in plantation reduces the number of bag in bush, 1000 seed weight and seed oil yield .In total, all three cultivars generate higher yield in early plantation date. But regarding the obtained results of the delayed plantation in Aleshtar city, it is useful to use Licord cultivar

Table1. simpel variance analysis of some *Canola* attributes

M.S.							
S.O.V	DF	grain yield	oil percent	1000-grain weight	grain per pod	pod per plant
Reptition	3	1226502.16^{ns}	0.427*	2.69^{ns}	17866.63**	301063.875*
Sowing date	2	67223.03^{ns}	7.181**	0.204^{ns}	15183.8*	714.039^{ns}
Varieties	2	820983.79^{ns}	1.84**	5.69^{ns}	15663.11*	166288.921^{ns}
S×V	4	244783.9^{ns}	0.071^{ns}	4.42^{ns}	808.64^{ns}	64104.932^{ns}
Error	24	355577.04	0.129	6.43	4246.3	85217.984
C.V.%.		16.41	7.98	11.52	21.84	17.99

*,**and ns:significant at 5% and1% level of probability and non significant respectively.

Table2. The comparisom of the mean effects of the cultivar and plantation date on some of the *Canola* features.

M.S.				
تیمار			pod per plant	grain per pod 1000-gr
335.5 a	21.87 a	4.650 a	44.01 b	
295. ab	21.67 a	4.392 a	44.12 b	
264.6 b	22.53 a	4.492 a	45.40 a	
292.4 ab	21.48 a	4.958 a	44.52 a	
265.6 b	22.78 a	4.350 b	44.69 a	
337.1 a	22.44 a	4.225 b	44.32 a	

Means in each column having similar ، are not significantly different at the 5% level.(DMR-TEST)

Table3.Mean comparrison the interaction of sowing date and variety effect on some .
traits of *Canola*

M.S.							
Var	pod per plant	grain per pod	1000-grain weight	oil percent	grain yield	Oil yield	Sowing date
14Sep	Opera	319.1 b	22.05 a	4.975 a	44.31 abc	4138 a	1835a
	Okapi	297.9 b	22.25 a	4.850 ab	44.45 abc	4042 a	1801a
	Licord	260.3 b	21.23 a	5.050 a	44.80 abc	3518 a	1577a
24Sep	Opera	257 b	22.05 a	4.650 abc	44.15 abc	3701 a	1649a
	Okapi	280.6 b	21.75 a	4.175 c	44.50 abc	3535 a	1575a
	Licord	259.0 b	24.55 a	4.225 c	45.42 ab	3650 a	1657a
4Oct	Opera	430.4 a	21.50 a	4.325 bc	43.58 bc	3211 a	1404a
	Okapi	306.4 b	21 a	4.150 c	43.40 c	3340 a	1495a
	Licord	274.4 b	21.83 a	4.200 c	45.97 a	3478 a	1609a

Means in each ، are not significantly different at the 5% level . (DMR-TEST)
column having similar

Reference

1 Aeeneh band A. 1994. To determine the growth curve and the effect of planting date on yield of four varieties of canola. Olive No. 124 monthly.

2 Pyrooz bakht, M. 1999. Ascending trend of vegetable oil imports can be controlled how. Farmer, No. 235. , Pages 82 to 84.

3 Haddad khodaparast,1994. edible oil technology in. Gutenberg Press.

4 Khajehpour, M.. 1986. Principles of Agriculture, Isfahan University of Jihad University Press.

5 Shirani Rad,A . 1993. Effect of planting date and plant density on growth and agronomic traits of rapeseed cultivars, Master Thesis of Agriculture Tarbiat Modarres University.

6 Ahmed. su1908.interrelationships among components and plant growth characters and contribution to yield two spectes of mustard can.J.plant sci. 60 :285-289.

7 Barszczak, z., t.Arsczak, t.Gor Czynski and Akotwaraw 1991. Effect. Of moisturve, nitrogen doses and soil acidity on seed yild, chemicchal Composition and thou sand seeds weight of some winter oilseed rape altivars. proc. int. canola cof. Saskachuan, cnada.pp.1181-1185.

8 Johnson, B.L., R. mckay, A.A. Schneiter, B. K. Hanson, B.G. Schatz.1995. Influence of planting on canola and crambe production of production Agriculture. 8:544 - 599.

9 Mc Gregore, k.I.1981. Patern of flower and pod development in rapeseed. can. j. plant. 61:274-282.

10 Mc kay, KRAASchneiterm BLJohnson.BKHanson. and B.G.Schatz.1992. Iflunce of planting date on canola and crambe production. North Dakota farm Reserch .49:23-26.

11 Raymer. PI1991.Selection of suitable canola cultivars For winte production in the southeastern united states. Int. Canola conf.sas kachuan, Canola

12 Scarisbrisk. O.H, R. W. Danils and M. cock. 1981. the effect of sowing date on theyield and yield components of spring oilseed rape. j.Agric. sci: 697:189-195.

13 Song, M., L. O. Copeland, and M.T. song .1995. Effect of planting date on freezing tolerance and winter survival of canola (Brassica napusL.). korean journal of crop scirnce 40: 150: -156.

14 Thurling, N .1974. Morphophysiological detrminates of yield in rapeseed Aust.9.Agric. Res. 25:711 - 721.

15 Topinka, ARC, downey, RKand Rakow, GF1991.Effect agronomic practices on the over wintering of winter canola in southerh Alberta. PP.665-670. In: MC Gegor, D.L. (ed). proceedings of the Eighth Interational Rapeseeed congress, Saskachuan, Canada.

16 Whitfild, DM1992. Effect of temperature and ageing on co2 exchange of pods of oil seed rape. field crop reseach, vol. 28. no4.