

Effect of sowing dates on yield and oil yield of new genotype of canola (*Brassica napus* L.)

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Abstract

Two trials were conducted at the Agricultural Farm Station of Karaj, Iran in two consecutive years (2007-2008, 2008-2009) during autumn seasons to find out optimum planting time for the newly developed rapeseed genotype Kimberly in the Karaj of Iran. There were five planting dates (September 15, September 25, October 10, October 20 and October 30). Dates of sowing significantly influenced the plant height, seed yield and oil yield the rapeseed in two years. The maximum seed yields (2.19 and 2.41 t/ha) were obtained from the 25 September planting and it was significantly different from all other planting dates in 2008-2009 year. The lowest seed yield was obtained from September 25 planting but it was at par to 15 and 5 October planting. Oil content of seed and total oil yields were also higher from September 15 planting. Seed and oil yields were reduced gradually with delayed in planting.

Keywords: Sowing date; canola; grain yield; oil yield

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Introduction

Rapeseed (*Brassica napus* L. and *Brassica campestris* L.) are the important oilseed crops throughout the world, ranked third among the oilseed crops after soybean and oil palm in production of vegetable oils, while fifth in the production of oilseed proteins. Rapeseed is also important oilseed crops of Iran. The production of oil seed in Iran is not high; about 80% of Iran's necessary oil is imported from foreign countries planting dates obviously affect canola yield and yield components. In this regard, it has been reported that at the early planting date, seed yield and straw yields were greater than late planting (Daly et al., 1988). Taylor and Smith, (1992) reported that yields of seed and oil declined when sowing was delayed beyond May (the optimum period of canola sowing in Australia) (Taylor, 1992). A number of studies have shown that yield declined in canola with delay in sowing (Hocking et al., 2001). Sowing time is an important factor that determines the length of growing season and hence yields. If planted in spring, they can

be grown as summer crop but the seed yield would be decreased due to short growing season and lack of enough water at the end of growing season, thus, winter cropping is preferred. Early spring sowing of oil canola delayed flowering and reduced reflection of radiation during flowering which were important factors leading to the highest yields achieved by late sowing (Jenkins et al., 1986). Planting time is one of the most important factors for maximizing canola yield especially in those areas where temperature, day length, rainfall and humidity vary throughout the year. This study was designed to find the effect of planting dates on the yield and oil yield of canola new genotype.

Materials and Methods

The experiments were conducted at the Agricultural Farm Station of Karaj, Iran, during two consecutive autumn seasons of 2007-2008 and 2008-2009, respectively. The experimental field was a piece of well drained high land with moderate even topography. The soil is acidic in nature with pH 6.2.

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Table 1: Growth parameter of rapeseed genotype Kimberly as influenced by different planting dates in (2007-2008, 2008-2009), Karaj of Iran

| Treatment | Plant height (cm) | | 1000-seed weight (g) | | Seed yield (t/ha) | | Oil yield (t/ha) | |
|------------|---------------------|---------------------|----------------------|--------------------|--------------------|--------------------|-------------------|-------------------|
| | 2007-2008 | 2008-2009 | 2007-2008 | 2008-2009 | 2007-2008 | 2008-2009 | 2007-2008 | 2008-2009 |
| 15 Sep. | 130 ^a | 154.7 ^d | 4.18 ^c | 3.85 ^c | 2.06 ^{ab} | 2.02 ^c | 1.04 ^d | 0.96 ^d |
| 25 Sep. | 136.5 ^{bc} | 131.3 ^{ab} | 4.18 ^c | 3.74 ^c | 2.41 ^c | 2.19 ^{cd} | 0.89 ^c | 0.89 ^c |
| 5 Oct. | 149.5 ^d | 127.4 ^a | 3.96 ^{ab} | 3.3 ^b | 2.02 ^{ab} | 1.80 ^a | 0.86 ^b | 0.76 ^b |
| 15 Oct. | 135.2 ^{ab} | 145.6 ^c | 3.52 ^a | 3.08 ^{ab} | 1.97 ^a | 1.85 ^{ab} | 0.83 ^a | 0.79 ^b |
| 25 Oct. | 130 ^a | 143 ^c | 3.52 ^a | 2.64 ^a | 1.91 ^a | 1.79 ^a | 0.82 ^a | 0.71 ^a |
| CV (%) | 5.62 | 12.32 | 7.22 | 12.31 | 7.4 | 6.23 | 7.41 | 9.34 |
| LSD (0.05) | 1.32 | 1.55 | 0.12 | 0.16 | 0.20 | 0.17 | 0.04 | 0.025 |

There were five dates of planting viz. September 15, September 25, October 10, October 20 and October 30. The treatments were arranged in a Randomized Complete Block Design (RCBD) with three replications having plot size 4m x 6m. All other fertilizers and ½ amount of the urea were applied during final land preparation; and the rest ½ of urea were applied at 15 days after seedling emergence. Weeding cum thinning, irrigation, and insect and disease control measures were done as per requirement. At maturity, 15 randomly selected plants were uprooted for data collection. Data were collected on plant height, 1000-seed weight, seed yield per hectare and oil yield per hectare.

Results and Discussion

Different dates of sowing had significant effect on plant height, 1000 seed weight, seed yield, oil yield (Table 1). Plants of early sowing flowered normally due to prevalence of favourable environment especially low temperature during vegetative growth phase which enhanced flower initiation in the genotype. Saran and Giri, (1987) also reported that October 11 sowing date gave earlier flower. This variation might have occurred due to temperature and moisture stress. Above and below this range, it reduced the growth rate by reducing plant height accumulation. The average of three years results revealed that the maximum plant height was found in 15 October planting and the shortest plant was found in delayed planting on October 25. The highest 1000-seed weight, seed yield were obtained from the September 25 planting, which was different from the other dates of planting. The highest seed yield (2.19 and 2.41 t/ha) was obtained from the plants of 25 September planting and it was significantly different from all other dates of plantings in the first and 2nd year. Three years average results revealed that the highest seed yield was obtained from 25 September planting. The seed yield was reduced with the advancement of sowing date from 5th October to 25 October. Chakraborty et al. (1991) stated that early sowing produced 24% higher seed yield than that of later sowing. Tuteja et al. (1996) also reported the highest seed yield from October 2 sowing but it was decreased by delayed sowing to October 22. Delayed planting reduced the seed yield drastically,

which might be occurred due to rapid initiation of inflorescence, flowering, fruiting and maturity. Brar et al. (1998) also reported increased seed and oil yield from early planting.

Conclusions

From the results of the experiment, it may be concluded that September 25 planting is the best time for higher seed yield of canola, Kimberly for the Karaj region of Iran.

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