



## ORIGINAL ARTICLES

### Grain Yield ,Oil Content and Number of Pods in Main Stem of Rapeseed Variety in Planting Different Densities (*Brassica napus* L.)

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#### ABSTRACT

To determine the grain yield ,oil content and number of pods in main stem of rapeseed variety in planting different densities and planting them in the test treatments and variety, Factorial experiment in randomized complete block design in three replicates in which the planting distance in three levels: 30, 40 and 50 cm in three levels and three varieties, including new lines (crossed two varieties of H19, goliath), Zarfam and Pahnab-e-joybar(Local varieties). This experiment was carried out in 2010-11 crop season. The results showed that In mean comparison of varieties has Maximum of grain yield the Zarfam variety(2454 kg\ha).

**Key words:** Rapeseed, Grain yield, Variety, Row spacing

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#### Introduction

In oilseed rape, row spacing or plant density vary considerably worldwide, depending on the environment, production system and cultivar. Previous studies have shown that plant density is an important factor affecting rapeseed yield. Plant density in rapeseed governs the components of yield, and thus the yield of individual plants. A uniform distribution of plants per unit area is a prerequisite for yield stability (Diepenbrock 2000). Al Barzinjy *et al.* (1999) investigated the effects of different plant densities ranging from 20 to 130 plants/m<sup>2</sup> in rapeseed. They concluded that pods per plant, seed weights and dry matter per plant decreased as plant density increased. Leach *et al.* (1999) also reported that plants grown at high density had fewer pod-bearing branches per plant but produced more branches, and that with an increase in density 1000-seed weight increased. The same researchers also observed that there was no effect of density on seed oil content. Rapeseed is sometimes grown in rows with spacing wide enough to allow for mechanical cultivation. In most areas where herbicides are used, the crop is either broadcast seeded or planted in drill rows spaced 15–20 cm apart (Lewis and Knight 1987).Rapeseed has generally slight or inconsistent seed yield responses to various row spacing's. Therefore, optimum densities for each crop and each environment should be determined by local research. However, there are no published research data on the plant density or row spacing response of rapeseed in the region of Chalooos,Iran of North. The objective of this study was to evaluate the effects of different spacing's between or within rows on the agronomic characteristics of three genotypes of *Brassica napus* new lines (crossed two varieties of H19, goliath), Zarfam and were Pahnab-e-joybar(Local varieties).

#### Material And Methods

In this field experiment was conducted in 2010-2011 in Chalooos Branch , Islamic Azad University Research Farm According to the weather , the weather hot and humid regions of the and With mild winters and hot summers and temperate and humid tropical areas is public.

To determine the effects of row spacing on yield components of three cultivars of rapeseed fall and planting them in the test treatments and variety, Factorial experiment in randomized complete block design in three replicates in which the planting distance in 3 levels: 30, 40 and 50 cm in 3 levels and varieties, including new lines (crossed two varieties of H19, goliath), Zarfam and were Pahnab-e-joybar(Local varieties). In this study, all stages of plant phenology and traits were measured, such as plant height, stem diameter, main stem branches, pod length, number of pods on main stem and branches, pods per plant, seed number, the pods on main stem and branches, seeds per pod, seed yield, biological yield, harvest index, seed oil content and seed oil yield and number of pods per plant. . The most important feature is the quality of canola oil Percent That determine the amount of seeds per plot in envelopes and placed 20 g was transferred to a laboratory. The canola seed oil was determined by NMR(Nuclear Magnetic Resonance) based on magnetic induction works and a hydrogen atom is spectrometry .According to statistical data model factorial design in randomized complete block analysis of variance was simple and mean comparison using Duncan's multiple range test was performed. Comparison of data for analysis and statistical software MSTAT-C – SPSS and Excel software was used for drawing diagrams.

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## Results And Discussion

### Grain Yield:

Grain Yield of rapeseed is the most important traits, can be affected in varieties, different treatments and different climates and the volatility is large (Shirani rad *et al.*,2005). In mean comparison of Varieties was found that the varieties in comparison with the average Zarfam 2454.8 kg\ ha and Pahnab-e-joybar varieties and with an average 1575.7 kg\ ha had the lowest yield. This is difference a significant between the varieties(Table 1). In the mean comparison distance of planting on yield attributes of varieties of the highest Pahnab-e-joybar with an average 2211.4 kg\ ha and The new line character to the lowest mean is 1983.4 kg per hectare that the simple analysis of data in normal distribution, this difference was significant(Table 2, Fig. 1). According to various research studies on the performance of different density can be changed. Given that the density of plants per hectare, the planting distance between plants on line and the line has fluctuated. And regional plans, the use of varieties Pahnab-e-joybar introduced to the short height is not a good performance. Chen *et al.*, The study of four different concentrations of 1,3,6 and 9 plants per square foot of rapeseed, Three planting dates, they observed an increase in density to 32 plants per square meter increased performance, But was observed with the increasing density of the reduced performance. The highest yield on 16 April and the density was 32 plants per square meter (Chen *et al.*,2008).

### Oil Content:

A simple analysis of variance showed that Simple varieties of the seed oil was significantly ( $P < 0.01$ )(Table 1) The comparison showed that varieties mean varieties Zarfam 40.9 of the most and new line (crossed two varieties of H19, goliath) with a mean of 27.9 percent allocated to the lowest seed oil. as noted above, this difference was significant among the varieties( $P < 0.01$ )(Table 2, Fig 2). In the mean interaction between varieties and sowing was found that the highest percentage of oil in this study Zarfam varieties with an average 41.8 % and 30 cm row spacing. and the lowest value of this attribute to a new line(crossed two varieties of H19, goliath) is obtained with the average 26.8 % and planting distance 30 cm. In this study, the density has no significant effect on the varieties the varieties of varieties Zarfam won the highest percentage of oil, In this study has not been seen the relationship between density and seed oil.

### The Number of Pods in Main Stem

Simple effects were significant numbers of pods on main stem( $P < 0.01$ )(Table 1) The effect of planting distance and the interaction between cultivars and planting on the main stem, number of pods per plant canola is not significant(Table 2, Fig 3). In the mean interaction between cultivars and planting was the largest bag in the main stem in the present study, a new line with the average 39.4 and planting distance of 30 cm and the lowest trait varieties Pahnab-e-joybar with an average 24.5 and the planting distance is 30 cm.

**Table 1:** Analysis of Variance on Some Agronomic Traits Affected by Different Variety and Planting Row Spacing (M.S)

S.O.V	D.F	Grain Yield (Kg\ha)	Oil Content %	Number of Pods in Main Stem
Replication	2	n.s	ns	ns
Variety	2	**	**	**
Row Spacing	2	*	ns	ns
Variety* R.S	4	n.s	ns	ns
Error	16	35519.2	30.9	282.09
C.V %	-	8.85	4.17	12.36

ns, \* and \*\*: Non significant at the 5 and 1% levels probability respectively.

**Table 2:** Mean Comparison of Grain Yield, Oil Content and Number of Pods in Main Stem of Rapeseed Variety in Planting Different Densities

Treatment	Grain Yield (Kg\ha)	Oil Content %	Number of Pods on Main Stem
Variety			
New line	2359.6a	27.9c	37.6a
Zarfam	2454.8a	40.9a	36.6a
Pahnab-e-joybar	1575.7b	31.1b	27.5b
Row Spacing			
30 cm	1983.4b	33.4a	33.4a
40 cm	2195.4a	32.7a	34.1a
50 cm	2211.4a	33.8a	34.2a

Means with similar letter were not significant at the 5% probability level.

New line:( crossed two varieties of H19, goliath)

Pahnab-e-joybar:( Local varieties)

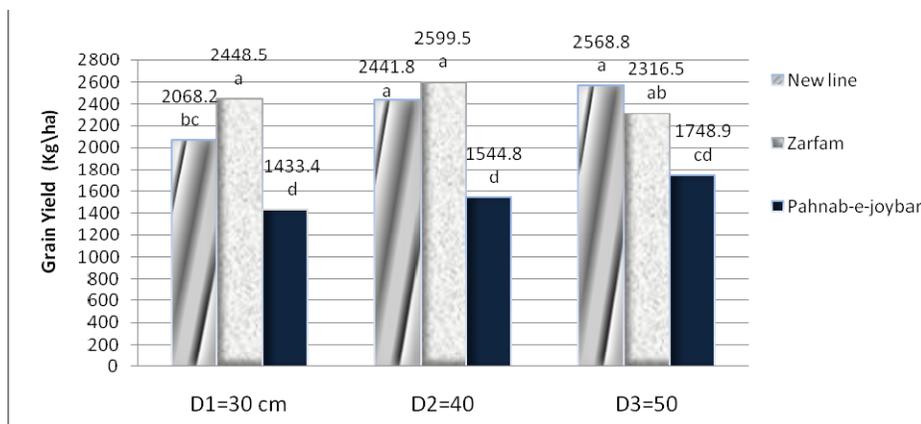


Fig. 1: Mean of Comparison the Grain Yield (kg/ha) Canola Varietis in Different Levells of Row Spacing

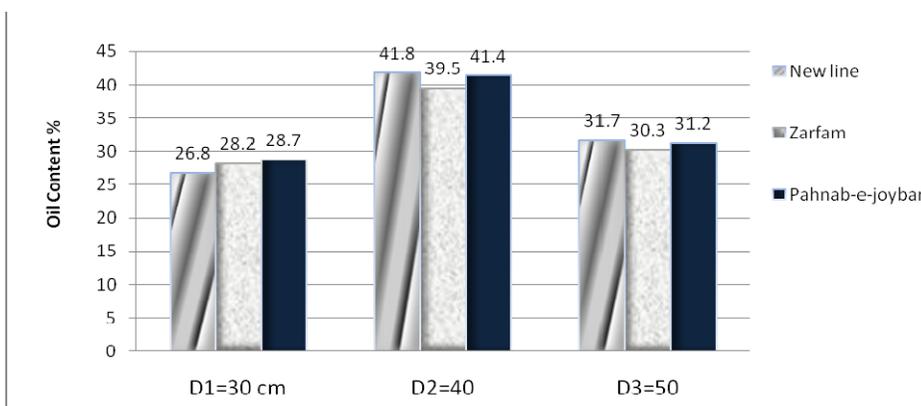


Fig. 2: Mean of Comparison Oil Content Canola Varietis in Different Levells of Row Spacing

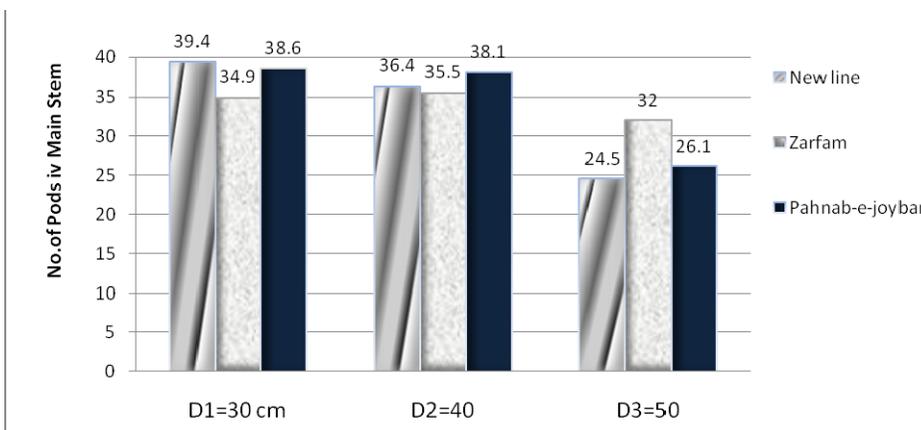


Fig. 3: Mean of Comparison Number of Pods on Main Stem Canola Varietis in Different Levells of Row Spacing

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