Study Of Planting Density On Some Agronomic Traits Of Rapeseed Three Cultivar  

(\textit{Brassica napus} L.)

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Abstract: Rapeseed and canola are closely related members of the mustard family (Brassicaceae) that are both grown as oilseed crops. To determine the effects of row spacing on yield components of three cultivars of Winter canola 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 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 Simple varieties has significant on the number of branches in plants (P<0.05), number of pods per branch, number of pods on main stem and seed oil Percent (P<0.01). The effect of planting distance has a significant effect on the number of branches and pods on main stem (P<0.01). 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.

Key words: Rapeseed, Row spacing, Seed oil percent, variety

INTRODUCTION

Canola is an important oil crop growing in many part of the world. Canola in Iran is mostly cultivated as a winter annual for oil production and rarely livestock feed. 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. 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/m2 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 Chaloos, 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 \textit{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 chaloos 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). At the end of the growing season, to determine the agronomic characteristics of each experimental plot, 10 plants were randomly selected and their characteristics were measured. 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.

RESULTS AND DISCUSSION

**The Number Of Branches Per Plant:**

Simple effects of planting distance and number of branches per plant in the level of five percent and one
percent is in the critical region, The interaction of cultivar and planting distance was not significant on the
branches of the rapeseed plant (Table 1). Effect of planting distance on average than the maximum number of
branches per plant, branches per plant Pahnab-e-joybar with mean 3.1 and the lowest number of branches per
plant, number of new lines with mean 2.2 is the time difference has been significant analysis of variance
(Table 1).

In the mean interaction between cultivars and planting was found that the highest number of branches per
plant of canola in this study, the new line is 50 cm row spacing. The interaction is also shown that with
increasing density (planting distance of 30 cm) is reduced of the number of branches per plant.

**The Number Of Pods On Lateral Branches:**

Simple effects of planting distance and number of pods on lateral branches is probably a significant
percentage the interaction of cultivar and planting distance has no significant effect on the lateral branches and
pods per plant of canola. In the mean interaction between cultivars and planting was found that the highest
number of pods on lateral branches in this study, Zarfam varieties with an average of 32.4 and the planting
distance of 50 cm and a new line(crossed two varieties of H19, goliath) with the average minimum is about 19.1
and the planting distance of 30 cm (Table1). Johnson and Hanson (2003), reported a higher performance culture
within narrower than wider rows, the plant is uniformly distributed, The proper distribution of solar radiation in
vegetation and reduce is competition within species and this will increase the number of pods per plant.

**The Number Of Pods On Main Stem:**

Simple effects were significant numbers of pods on main stem(P<0.01). 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 1). 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.

**Concentration Of Seed Oil:**

A simple analysis of variance showed that Simple varieties of the seed oil was significantly (P<0.01). 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 1). 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.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>The number of branches per plant</th>
<th>The number of pods on lateral branches</th>
<th>The number of pods on main stem</th>
<th>Concentration of seed oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1 = New line</td>
<td>2.8a</td>
<td>22.2b</td>
<td>37.6a</td>
<td>27.9c</td>
</tr>
<tr>
<td>V2 = Zarfam</td>
<td>2.3b</td>
<td>28.3a</td>
<td>36.6a</td>
<td>40.9a</td>
</tr>
<tr>
<td>V3 = Pahnab-e-joybar</td>
<td>2.8a</td>
<td>19.3c</td>
<td>27.5b</td>
<td>31.1b</td>
</tr>
<tr>
<td>Row Spacing (B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.S.1 = 30 cm</td>
<td>2.2c</td>
<td>20.2c</td>
<td>33.4a</td>
<td>33.4a</td>
</tr>
<tr>
<td>R.S.2 = 40 cm</td>
<td>2.7b</td>
<td>23.2b</td>
<td>34.1a</td>
<td>32.7a</td>
</tr>
<tr>
<td>R.S.3 = 50 cm</td>
<td>3.1a</td>
<td>26.3a</td>
<td>34.2a</td>
<td>33.8a</td>
</tr>
<tr>
<td>Variety * Row Spacing (AB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1,R.S.1</td>
<td>2.2cd</td>
<td>19.1de</td>
<td>39.4a</td>
<td>26.8d</td>
</tr>
<tr>
<td>V1,R.S.2</td>
<td>2.8abc</td>
<td>21.4de</td>
<td>34.9a</td>
<td>28.2cd</td>
</tr>
<tr>
<td>V2,R.S.1</td>
<td>3.4a</td>
<td>26.1bc</td>
<td>38.6a</td>
<td>28.7cd</td>
</tr>
<tr>
<td>V2,R.S.2</td>
<td>1.9d</td>
<td>23.5cd</td>
<td>36.4a</td>
<td>41.8a</td>
</tr>
<tr>
<td>Variety</td>
<td>RS1</td>
<td>RS2</td>
<td>RS3</td>
<td></td>
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<tr>
<td>V2</td>
<td>2.48</td>
<td>2.85</td>
<td>2.58</td>
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</tr>
<tr>
<td>V3</td>
<td>2.69</td>
<td>2.95</td>
<td>3.10</td>
<td></td>
</tr>
</tbody>
</table>

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

Levels of significant:
- * = P < 0.05
- ** = P < 0.01
- NS = not significant

New line: (crossed two varieties of H19, goliath) Pahab-e-joybar (Local varieties)

REFERENCES


Grom bacher, A., L. Nelson, 1996. Canola Production. Canola, which produces a vegetable oil low in saturated fat, has the potential for becoming an alternative crop for Nebraska agriculture. Institute of Agriculture University of Nebraska- Lincoln.


