Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 4 [1] December 2014: 36-39

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804

ORIGINAL ARTICLE

Effect of nitrogen different levels on Canola (SOR19 Variety) yield and yield components in north of Khuzestan, Iran

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ABSTRACT
In order to study the effect of nitrogenous fertilizers on yields and yielding parts of Canola cultivar Sor19, an experiment were conducted on agricultural period at experimental farm of Dezful University in 2012. The experiment design was completely randomized and has been repeated for three times. The design included twelve experimental terraces, furrow irrigation method were applied and the water need in an I_{100} millimeter level and the experiment also had contained four fertilizer levels of N_0, N_{100}, N_{150} and N_{200} Kg per hectare. The SPSS were applied to analyze the data and in order to compare the means, Duncan test was applied. The achieved results showed that the different levels of Nitrogenous fertilizer had significant effect on yields and yielding parts of Canola.
Key words: Nitrogen, Canola grain yield, Nitrate, Dezful.

Received 09.07.2014 **Revised 12.08.2014** **Accepted 23.09.2014**

INTRODUCTION

One of the most important factors in the yield of canola is the absorbable amount of nitrogen in a farm. Nitrogen as one of the most usable element in agriculture plays a crucial role in plants production and its optimum usage will increase the yield and decrease the contamination. Nitrogen leads increase in the yield because it can effect on growth factors of a variety [1]. Numbers of experiments have been conducted on the effects of different amount of nitrogen fertilizer on canola yield. With the enhancement of used nitrogen in to 213 Kg per hectare, researchers witnessed a constant increase in yield [2]. The advisable amount of nitrogen to be used differs from place to place. In India, the amount of nitrogen fertilizer in condition of irrigation is 40-120 Kg per hectare and in condition of dry farming it is 30-60 Kg per hectare [3]. [4] Advised that the proper amount of nitrogen fertilizers should be determined according to organics existing in the soil. In a design the effects of irrigation and the amount of nitrogen on the yield of canola and canola oil has been studied. Then it was concluded that the amount of irrigation and nitrogen caused enhancement of both seeds' yield and seeds' oil in way that it varied up to 46.4% in nitrogen free treatments and up to 45.6% in treatment with 200Kg nitrogen [5]. [6] reported that in comparison to not using nitrogen fertilizers, the usage of 80 Kg nitrogen per hectare increases the yield up to 91%. The purpose of conducting this study is to determine the yield of canola while applying different treatments of nitrogen fertilizers in Khuzestan and also in lands that were irrigated via method of surface irrigation which contains high water losses.

[7] conducted a research on different levels of nitrogen fertilizers and micronutrient of zinc. The results showed that the increase in usage of fertilizers has a significant effect on the weight of 1000 canola seeds and seeds yield. Additionally, it was concluded that a significance difference among various levels of fertilizers i.e. 20, 40, 60 Kg purred nitrogen in each 0.42 of hectare. In this research, Effect of nitrogen different levels on Canola (SOR19 Variety) yield and yield components in north of Khuzestan, Iran was investigated.

MATERIALS AND METHODS

The present study was conducted in 2012, in Dezful. Dezful is located on the north of Khuzestan. It is placed in geographical length of 48 degree and 24 minutes from the east, the geographical width of 32 degree and 22 minutes from the north and the height level of 147 meters from the sea level. The research method was field study and was conducted on an experimental farm of Islamic Azad University of Dezful located in Sanjar agricultural region. In order to study the effects of furrow irrigation and nitrogen fertilizers on plants' characteristics and also investigating the applicability of nitrogen fertilizers and yields of canola cultivar SOR19 seeds, an experiment has been conducted. The experiment's design was completely randomized and had been repeated for three times. The design included twelve experimental terraces, furrow irrigation method were applied and the water need in an I_{100} millimeter level contained four fertilizer levels of N_0, N_{100}, N_{150} and N_{200} Kg per hectare.

Before conducting the experiment a soil sample has been extracted from the depth of 0-30 cm and 30-60 cm of the experimental terrace in order to determine soils' physical and chemical features like soils' texture, SP, EC PH and the amount of organics exist in the soil. After that the terrace was prepared to cultivate canola cultivar sor19. The experiment was started on September. In the control treatments no nitrogen fertilizer has been used i.e. N_0. The second treatment was N_{100} 2.5 Kg per hectare, the third one was N_{150} 3.75Kg per hectare and the forth one was N_{200} 5Kg per hectare. This amount of nitrogen fertilizers has been specified for each of the twelve terraces and in three phases. The method of furrow irrigation was applied and all terraces have been irrigated in six phases since. Four months later, after cultivation and treatments, the canola seeds were harvested manually, and their yields include the number of pod in a bush, the number of seeds in pod and the weight of 1000 seeds have been measured. The SPSS version 15 and the Duncan test were applied for analyzing the data.

RESULTS AND DISCUSSION

The effect of different nitrogen fertilizer treatments on the number of pod in a bush, the number of seeds in pod and the weight of 1000 seeds have been measured were investigated. The variance analysis showed that there is a significant difference between different levels of nitrogen fertilizer treatments and the amount of seeds in canola pod with the meaningful level of 5%. Also, there is a significant difference between different levels of nitrogen fertilizer treatments and weight of 1000 canola seeds and yield of the seed with the meaningful level of 1%.

The comparisons of the different levels of nitrogen fertilizer treatments and the amount of seeds in a pod showed that the highest number of seeds in a pod (209.7) was related to the treatment with N_{200} and the lowest amount of seeds in a pod (203.3) was related to the treatment with N_0. (Figure.1)

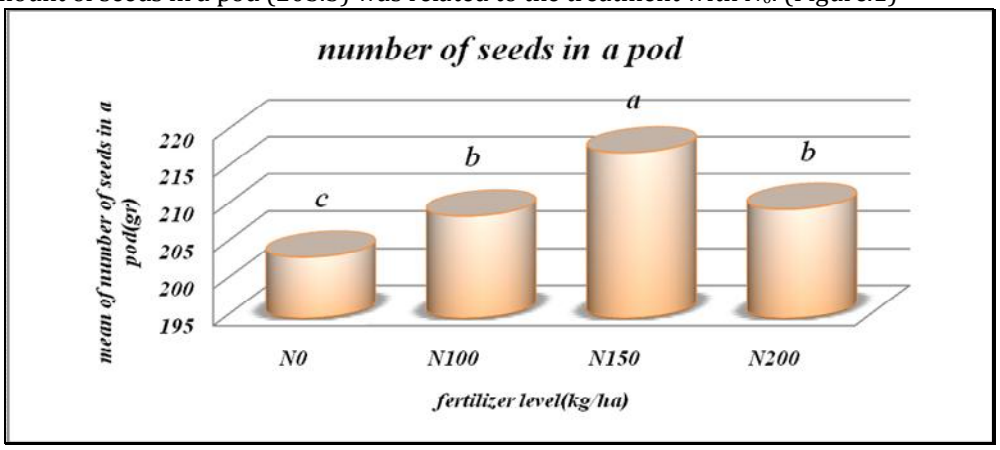

Fig 1. Comparison mean of number of seeds in a pod

The comparisons of different phases of treatments showed that the highest average of pods in a bush (593.3) was related to treatment with N_{150} and the lowest average of pods in a bush (312) was related to nitrogen without treatment i.e. N_0. (Figure. 2)

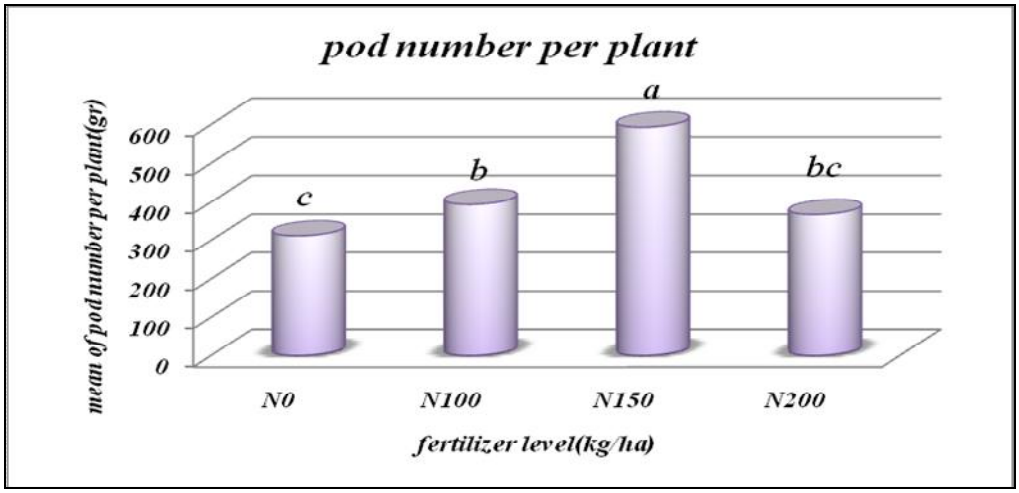

Fig 2. Comparison mean of pod number per plant

The comparisons of the effect of nitrogen fertilizers on weight of 1000 canola seeds showed that the heaviest weight (4.7 g) was related to treatment with N_{150} and the lightest weight (4.4) was related to the treatment with N_0. (Figure. 3)

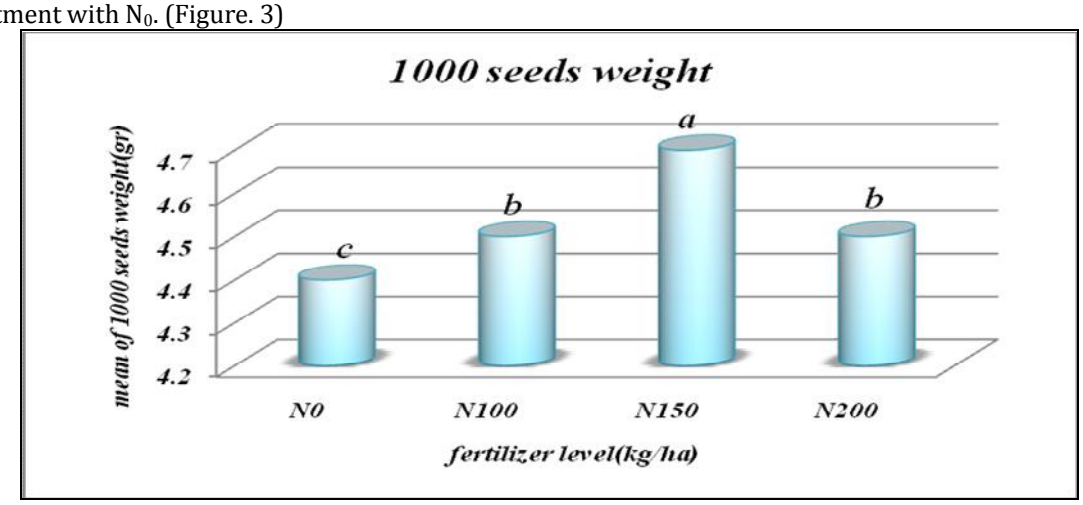

Fig 3. Comparison mean of 1000 seeds weight

The effects of nitrogen fertilizer on yield of the seed showed that the lowest yield (1.06) was related to N_0 and the highest (1.31) was related to treatment with N_{150}. (Figure. 4)

As long as in treatment with N_0 high yield has been observed it can be concluded that the farm's experimental soil possessed high fertility.

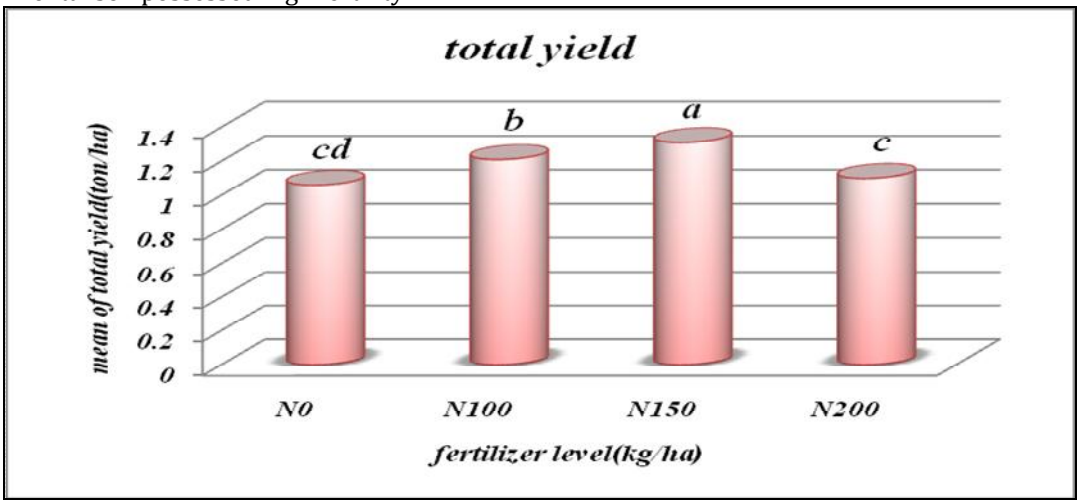

Fig 4. Comparison mean of total yield

CONCLUSION

In this research, Effect of nitrogen different levels on Canola (SOR19 Variety) yield and yield components in north of Khuzestan, Iran was investigated. Results of this research showed that the different levels of Nitrogen fertilizer had significant effect on yields and yield components of Canola. The effects of nitrogen fertilizer on yield of the seed showed that the lowest yield was related to N0 and the highest was related to treatment with N150. Thus in this agricultural region, 150 Kg/ha level is optimum for Canola SOR19 variety cultivation.

KCKNOWLEDGMENT

The Authors are sincerely grateful to the Research Office of Islamic Azad University of Dezful Branch for their generous financial, administrative and organizational supports without which this study would have been completed.

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CITATION OF THIS ARTICLE

Ali A, Neda G K, Ali G. Effect of nitrogen different levels on Canola (SOR19 Variety) yield and yield components in north of Khuzestan, Iran. Bull. Env. Pharmacol. Life Sci., Vol 4[1] December 2014: 36-39