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ORIGINAL ARTICLE

Effect of Nitrogen Fertilizer on Drain water Salinity in Canola (Sor19 variety) Cultivated under Furrow irrigation in north of Khuzestan

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ABSTRACT
Nitrogen fertilizers are one of the main contaminators of water resources because they leach the soils' No_3 and they are also being overused. The purpose of this study is to determine the density of leached Nitrate from the drainages of Canola plants cultivar Sor19. These Canola plants were treated by nitrogenous fertilizers in Dezful. 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 achieved results showed that the effect of different levels of Nitrogenous fertilizers on water salinity in the depth of 30 cm was not significant but in the depth of 60 cm was significant at P≤0.05.
Key words: *Nitrogen, Salinity, Nitrate, Dezful.*

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INTRODUCTION

Canola or Brassica napus L. is the third most famous oil plants all over the world. Because of various advantages like being resistant against dryness, coldness and salinity, possessing high periodic value and high competition with the weeds, nowadays in vast parts of the worlds' farms-in proportion to other seeds- Canola is being harvested. Jihad-e agricultural ministry self-sufficiency programs on the most basic food products including oil production, has focused on expanding canola cultivation. In 1998 the width of canola farms in Iran was17240 hectare with the average yield of 970 Kg per hectare, while in 2008 the width of canola farms has reached to 117323 with the average yield of 1483 Kg per hectare. These statistics show that the average yield and canola farms' width have been increased [1].
Canola plants need high amount of nitrogen and they are considered as high nitrogen demanding plants - even more than wheat [2]. Many researchers have shown that the yield of canola can be enhanced qualitatively and quantitatively via appropriate management of nitrogen fertilizers and density of bushes. Further it should be considered that increase in the amount of nitrogen will cause the enhancement of seeds yielding on the unit of area [3]. On the other hand high application of nitrogen in reproduction stages will cause increase the amount of the protein exists in canola seeds and of course decrease the amount of oil [4]. Many researchers have proved that the effect of nitrogen resources on different products varies [5]. According to Chrisms, the reactions of canola cultivars vary depending on the place and also some of the canola cultivars show more reactions to the climate conditions [6].

METHODS AND MATERIALS

The present study in Dezfool with 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 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. 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.
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 phase. In order to gather the drainage, the vase shape bowels were dug in the depth of 30 and 60 cm. the drainage samples were gathered in six phases. Then the EC meter measured the salinity of the drainage. The SPSS version 15 and the Duncan test were applied for analyzing the data.

RESULTS AND DISCUSSIONS

This experiment was conducted on three level of fertilization 100, 150 & 200 Kg per hectare. After determining the amount of salinity in drainage, the data were input into EXCEL and were shown in a diagram. In order to determine the average amount of salinity Duncan test and SPSS version 15 were applied. The results are presented in table 1.

Table 1. Comparison mean of Ec (µmhos/cm) in nitrogen different level

Nitrogen levels (kg/ha)	Ec in soil depth of 30 cm	Ec in soil depth of 60 cm
100	851/33 [a]	837/66 [b]
150	841[a]	868[b]
200	832[a]	1006[a]

According to data shown in table 1, the effect of different levels of treatments on the salinity in depth of 30cm was not significant. The salinity related to third treatment level i.e. 100Kg per hectare with salinity of 851.33 and the lowest salinity related to forth level of treatment i.e. 200Kg per hectare with salinity of 832.66. The effect of different levels of treatments on the salinity in depth of 60cm was also significant. The salinity related to forth treatment level i.e. 200Kg per hectare with salinity of 1006 and the lowest salinity related to second level of treatment i.e100Kg per hectare with salinity of 837.66.
As it is shown in figure 1, there is a direct relationship between the amount of used nitrogen fertilizer and the salinity in drainage water. with enhancing the treatment levels, the drainages' salinity are enhanced. The salinity change line was also descending because in previous irrigations soils' ions were leached.

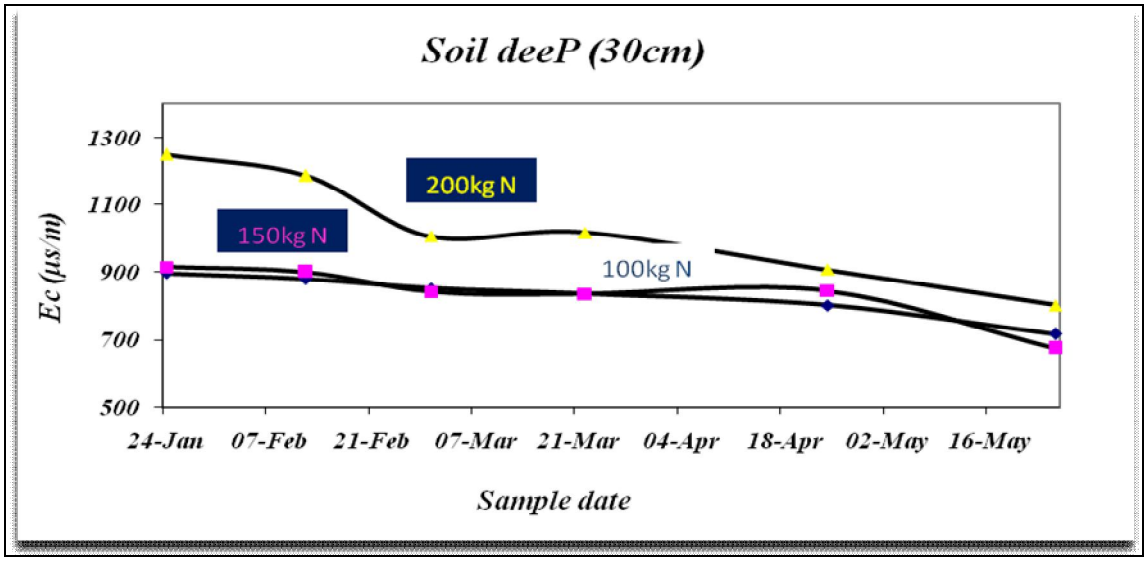

Fig 1. Change of soil salinity in soil depth of 30 cm and nitrogen different levels

As it is shown in figure 2, there is a direct relationship between the amount of used nitrogen fertilizer and the salinity existing in drainage i.e. with enhancing the treatment levels, the drainages' salinity are enhanced.

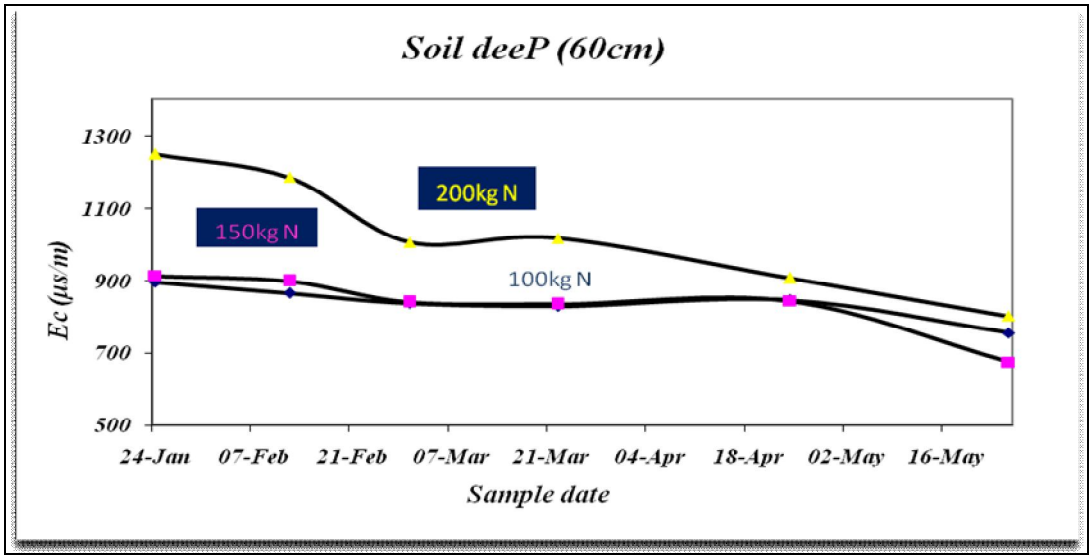

Fig 2. Change of soil salinity in soil depth of 60 cm and nitrogen different levels

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