THE INFLUENCE OF ALGAREN AND CULTIVAR ON YIELD AND YIELD COMPONENTS OF RAPESEED

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Abstract- Rapeseed is an annual oil and protein crops. This study was carried out using Algaren (0, 0.1, 0.2 and 0.3%) and two cultivars of rapeseed (Hyola 401 and ROS) in a factorial experiment based on randomized complete block design (RCBD) with three replications at a field in Firoozabad, State of Fars, Iran. The Algaren altered yield and yield components of rapeseed. The highest values of lateral shoots, pods per main branch, seeds per pod, 1000-seed weight and grain yield were obtained at 0.3%. The cultivar Hyola 401 revealed the higher number of lateral shoots and pods per main branch. The seeds per pod and 1000-seed weight was higher at cultivar ROS. The grain yield was not significantly different among two cultivars.

Keywords- Brassica napus, organic fertilizer, Hyola 401, ROS.

I. INTRODUCTION

Bio fertilizers are microbial inoculants consisting of living cells of micro-organism like bacteria, algae and fungi alone or combination which may help in increasing crop productivity. Biological activities are markedly enhanced by interactions (Tilak and Reddy, 2006). Organic fertilizers can improve the biodiversity (Enwall et al., 2005; Birkhofera et al., 2008) and may prove a large depository for excess carbon dioxide (Lal, 2004). Organic fertilizers in comparison of the chemical fertilizers have lower nutrient content and are slow release but they are as effective as chemical fertilizers over longer periods of use (Naguib, 2011). Algaren is from an algae, Ecklonia maxima contains hormones, proteins, amino acids, vitamins etc. In ranking, rapeseed (Brassica napus L.) oil is third behind soybean (Glycine max L.) and oil palm (Guineensis elaeis) showing the importance of this product. It is one of the most important annual oil and protein crops in temperate climates. Apart from direct human and animal consumption, industrial uses include the manufacture of rapeseed oil or use as a source of bio-diesel fuel production have been developed in the recent years in world (Ofori and Becker, 2008; Kandil et al., 2012). Its production has been notably extended during recent years in Iran (Mohammadi and Amiri, 2010). Rapeseed has high value of oil (40 - 45%) and protein (39%) (Eskandari and Kazemi, 2012). The aim of this experiment was evaluation of application of Algaren on yield and yield components of two cultivars of rapeseed.

II. DETAILS EXPERIMENTAL

2.1. Materials and Procedures

The study was conducted using Algaren (0, 0.1, 0.2 and 0.3%) and two cultivars of rapeseed (Hyola 401 and ROS) in a factorial experiment based on randomized complete block design (RCBD) with three replications at a field in Firoozabad, State of Fars, Iran. Each plot (3×2 m) contained rows with spacing of 3-5 cm between plants within the rows. The soil of the field was tested before planting and showed PH=7.78, N=trace, available P=1 mg/kg, available K=66 mg/kg, and organic C=trace. Algaren was used three times by intervals 20 days. Finally, the plants of each plot were harvested for measurement of yield and yield components.

2.2. Statistical Analysis

Data from the study were subjected to analysis of variance (ANOVA) using statistical analysis software (SAS) and the means compared with Duncan's new multiple range test (DNMRT) at $P < 0.05$.

III. RESULTS AND DISCUSSION

The Algaren changed yield and yield components of rapeseed (Table 1). The maximum number of lateral shoots (8.33) was achieved on 0.3% Algaren which was significantly different when compared to 0 and 0.1%. The highest values of pods per main branch, seeds per pod and 1000-seed weight were obtained at 0.3%. The maximum grain yield (29.72 g) was achieved on 0.3% which was not significantly different when compared to 0.2%.

The cultivar Hyola 401 revealed the higher number of lateral shoots (7.75) and pods per main branch (209.25) when compared to cultivar ROS. The seeds per pod and 1000-seed weight was higher at cultivar ROS. The grain yield was not significantly different among two cultivars (Table 2). An experiment by dry yeast and compost tea in growing medium of borage plants revealed that compost tea increased plant height, fresh and dry weight of aerial parts and flowers and number of branches and suckers and dry yeast was effective on growth parameters and oil content (Ezz El-Din and Hendawy, 2010).

An investigation illustrated that the application of combined treatment of bio-fertilizers gave better

results for all studied traits in marjoram plants (Gharib et al., 2008).

An Egyptian experiment showed that some organic fertilizers could improve growth parameters and yield of Thymus vulgaris L. (Ateia et al., 2009). Application of saline water in addition to peanut compost slightly increased plant fresh and dry weights on geranium plants (Leithy et al., 2009).

Algaren due to its hormones, proteins, amino acids, vitamins etc, can enhance yield and yield components of the plants.

Table 1. Effect of Algaren on yield and yield components of rapeseed.

Algaren (%)	number of lateral shoots	pods per main branch	seeds per pod	1000-seed weight (g)	grain yield (g)
0	5.50b	140.50c	41.17ab	14.29c	27.99c
0.1	6.17b	141.17c	40.00b	14.46c	28.73b
0.2	8.17a	145.67b	42.67a	15.20b	29.18ab
0.3	8.33a	153.17a	43.33a	15.86a	29.72a

In each column, means with the same letters are not significantly
different at 5% level of Duncan's new multiple range test.

Table 2. Effect of cultivar on yield and yield components of rapeseed.

cultivar	number of lateral shoots	pods per main branch	seeds per pod	1000-seed weight (g)	grain yield (g)
Hyola 401	7.75a	209.25a	37.00b	14.79b	28.88a
ROS	6.33b	81.00b	46.58a	15.11a	28.93a

In each column, means with the same letters are not significantly
different at 5% level of Duncan's new multiple range test.

CONCLUSIONS

Under present experimental conditions, Algaren at 0.3% resulted in the best values of yield and yield components. In our experimental field, there was not significant difference between two cultivars regarding the yield.

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