



Effect of Weed Interference on Yield and Agronomical Characteristics of Fenugreek (*Trigonella foenum gracum*) in Different Plant Density under Birjand Conditions

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Introduction

Iran is among the countries with a climate appropriate for growing a wide range of herbs, and can be a great source of producing and exporting plants. Fenugreek (*Trigonella foenum gracum*) is one of the oldest plant and it is an annual herbaceous plant of the Fabaceae family (Fabaceae) which are dry, brown or reddish-yellow to gray to over 5.3 mm. Seeds of this plant are used as a spice and its leaves are used as a vegetable. Among the most important factors in farming, it is important to use appropriate planting density. Therefore, if all the necessary conditions, including the right, but density is inappropriate, it will not get the optimum yield per unit area. The effective management of weeds increase the performance of weed management practices, reduce weed population and the costs associated with it over time. Weeds compete with crops for a variety of sources such as light, water and minerals. Given that the best time weeding the weeds and the most appropriate density of fenugreek is not much information available, this study aimed to determine the appropriate density of weed infested and fenugreek was used.

Materials and Methods

In order to determine the effects of weed interference and appropriate density of fenugreek, a field trial was conducted in research farm of Birjand Islamic Azad University during the spring of year 2011. The experiment was a factorial based on randomized complete block design. The treatments were fenugreek density at 10, 20 and 40 plants m⁻² and weed interference in five levels included weed-free to maturity, 20, 40 and 60 days after emergence, and no weeding. Fenugreek seeds (spherical, brown) of pure seed before planting desert of preparation and sterilization by benomyl and then do planting trees and irrigation was done immediately. Irrigation was applied every seven days. During the study, pests and diseases were completely controlled. Weed control was done manually in three stages. Traits such as grain yield, plant height, biological yield, number of branches per plant and harvest index were measured. Ultimate performance were measured when the plant pods were yellow and dried. At the beginning of each plot five plants randomly chosen to measure the morphological characteristics and traits in yield components were recorded and then removed 50 cm of the margins of the plot, the rest were taken to determine the function. Analysis of variance and statistical analysis was performed using SAS and Excel softwares, Mean comparison was done by Duncan test at 5 percent.

Results and Discussion

Analysis of variance showed that the density and weed interference were significant at 1 and 5 percent, respectively. The interaction between density and weed interference on yield was significant at 5% level too. By prolonging the period of weed interference, the yield fell to the lowest amount of weeding treatments. The significance of the interaction between density and weed interference represents different responses in different levels of compression performance is to weed competition. In general, the choice of planting density and suitable crop can reduce weeds, increase competitive ability of the crop and increase its performance. Biological yield was significantly affected by the plant density. The density of planting, the maximum density of 40 plants (325.56 grams per square meter) and the lowest density of 10 plants (232.66 grams per square meter) and biomass production. Biological yield was not affected significantly by weed interference. Although by increasing time interval of weeding time (up to 20 days) biological yield decreased from 280.49 to 257.49, but this reduction was not significant. The interaction between planting density and weed interference on biological

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performance was not significant. Most biological yield was achieved in the absence of weeds. This is not unexpected because the availability of a large part of the resources cause more shoots in plant during the growing season. Biomass density was significantly increased. Similarly, the highest density (40 plants per square meter) due to a larger and more use of sunlight, biomass, leaf area, more than other densities produced. Analysis of variance showed that the effect of weed interference density and harvest index was not significant, but the interaction between plant density and harvest index was significant. Comparison of the average harvest index in different interference treatments showed that the condition of all the weeding and no weeding had the highest (21.98) and the highest (16.57) harvest index. The effect of density was not significant on the harvest index and harvest index did not indicate any significant differences in different densities. Decreased harvest index showed an increase in the plant more susceptible to weed interference was the harvest index. The effect of weed interference on dry weeds had no significant effect on the dry weight of weed density and weed interference and interaction at the level of 5%. With exception of the treatment as lack of control over weeds, highest and lowest dry matter related to the treatment of 60 days after emergence, and the treatment of 20 days after emergence. The effect of weed interference on the number of weeds was significant. The number of weeds per square meter decreased by increasing the duration of the interference. So that the number of weed emergence after 60 days of treatment, compared to 20 days after emergence treatment was lower by 44 percent. Possibly reducing the number of weeds with time, was due to increased competition within species and between species of weeds for growth resources. The competition will serve to eliminate the weaker plants called to this phenomenon. Weed production in the treatments (weed control) can be the result of a longer period of weed interference and greater use of light, water and nutrients. Fenugreek plant height was significantly affected by plant density and by lowering density, plant height reduced. Interaction of plant height was significant at the five percent level and the highest plant height obtained at 60 days after emergence weeding treatments and lowest in control. Analysis of variance showed that the effects of congestion and interference on the number of branches per plant, weed density and weed interference significant interaction on plant height and number of branches per plant was not significant. The number of branches per plant were significantly influenced by the density of planting.

Conclusions

In general, the results of this study showed that the presence of weeds fenugreek is able to withstand up to 20 days after emergence and remove weeds after this stage, significantly increased performance. This shows that weed control should be applied early in the season. Also, due to the lack of change in the plant density increased number of branches and whereas the highest density, highest grain yield was also more likely to increase the density to be accompanied.

Keywords: Dry matter, Harvest index, Weed, Yield