

Abstract

In order to study the effect of plant density and different levels of nitrogen on yield and yield components of sunflower (*Helianthus annuus* L.) in agroforestry system an experiment was conducted at Aligoudarz agriculture research station, Lorestan, Iran, during 2012 growing season. The experimental design was split plot based on randomized complete blocks (RCBD) with three replications. Nitrogen fertilizer was applied at four different levels (N1= no fertilizer; N2 = 75kg; N3 = 150kg; N4 = 225kg) as a main factor which were allocated to main plots. Three levels of plant density (plant spacing on row) as a secondary factor allocated to subplots as follows: (D1 = 10cm; D2 = 15cm; D3 = 20cm). Nitrogen fertilizer was applied in two stages: the early stage of plant growth (4 to 6 leaf stage) and late shoot growth (before the flowering). In this study the quantitative characteristics were included (plant height, stem diameter, petiole length, leaf length and width, capitulum diameter, number of seeds per head, 1000-seed weight and number of hollow grain), also qualitative characteristics such as protein and oil grain content were measured. Results showed that yield and yield components of sunflower in agroforestry systems affected by nitrogen fertilizer and plant density significantly. So that quantitative and qualitative performance increased by different treatments of nitrogen and plant density. The highest sunflower yield had been achieved in 225 kg nitrogen fertilizer application and 20 cm on row apart treatments. According to the results it could be suggested that application of 225 kg nitrogen fertilizer and 20 cm plant density apart treatments at agroforestry state by promoting of quantitative and qualitative characters improved sunflower growth.



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**Effects of plant density and different levels
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in agroforestry system**

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