Effects of biological and chemical fertilizers nitrogen on yield quality and quantity in Fennel (*Foeniculum vulgare* Mill.)

Mashalah Daneshvar¹, Mohammad Reza Vazirimehr², Hassan Shahgholi³, Ghassem Hosein talaei⁴, Ebrahim Sabbagh², Khashayar Rigi⁵*

¹Department of Agronomy, Faculty of Agriculture Sciences, Lorestan University, Khoramabad, Iran
²Department of Plant Production, Khash Branch, Islamic Azad University, Khash, Iran
³Young Researchers and Elite Club, Aligoodarz Branch, Islamic Azad University, Aligoodarz, Iran
⁴Young Researchers and Elite Club, Khorramabad Branch, Islamic Azad University, Khorramabad, Iran

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**Abstract**

Considering the importance of medicinal plants growth and biological application of fertilizers with sustainable agricultural production in order to eliminate or reduce chemical input to achieve desirable and sustainable quality, an experimental research based on randomized complete block design with two factors of chemical nitrogen (46% urea nitrogen) at three levels (Zero, 25 and 50 kg.ha⁻¹), biological nitrogen (Azotobacter) with trade name Nitroxin at two levels inoculated and non-inoculated was carried in 2013 at the research farm of Khoramabad in Lorestan, Iran. The results of analysis of variance showed that the effects of biological fertilizers (Azotobacter) Nitroxin of chemical (urea 46%) nitrogen in different treatments on biological yield, grain yield, harvest index (HI) and essential oil yield were significant at P≤0.01. The means showed that the greatest biological yield (3875 kg.ha⁻¹), grain yield (1017 kg.ha⁻¹) and essential oil yield (19.38 kg.ha⁻¹) were obtained by a treatment of Nitroxin + chemical nitrogen (25 kg.ha⁻¹). In general, results of the present study revealed that application of biological fertilizers plays a remarkable role in improving yield quality and quantity in Fennel and they can be viewed as a suitable replacement for chemical fertilizers.

*Corresponding Author: Khashayar Rigi  krigli66@yahoo.com