Response of nitrogen, phosphorus and zinc efficiency of fenugreek
(Trigonella foenum-graecum) to combination of chemical and
biological fertilizers in greenhouse culture

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Abstract
In order to investigate the effect of combination of chemical and biological fertilizers on dry matter, uptake and efficiency of nitrogen (N), phosphorus (P) and zinc (Zn) by fenugreek (Trigonella foenum-graecum), an experiment was conducted as randomized complete blocks design with three replications in the Research Greenhouse of Shahrekord University. Eight fertilizer treatments consisted of control (no fertilizer), urea fertilizer (UF), UF+ zinc sulfate (ZS), UF+ Azotobacter (Az), UF+ mycorrhiza (My), UF+ ZS+ Az, UF+ ZS+ My and UF+ ZS+ Az+ My. Results indicated that there was significant difference (P ≤ 0.05) among different fertilizer treatments for agronomic efficiency of N, P and Zn. The highest agronomic efficiency of N, P and Zn (60, 96 and 198 g/g, respectively) was achieved in UF+ZS+Az treatment. The highest P-uptake efficiency (18.7 %) was observed in UF+My treatment and it had significant (P ≤ 0.05) difference with other treatments, except UF+ZS treatment. The highest Zn physiologic efficiency was obtained in UF+ZS, which had no significant difference with UF+ ZS+ Az and UF+ ZS+ Az+ My. Maximum dry matter (292 g/m²) was produced in UF+ ZS+ Az treatment. In general, application of biofertilizers, especially Azotobacter, integrated with urea and zinc sulfate not only is effective in increasing dry matter, but also can increase productivity of fenugreek by increasing chemical fertilizers’ efficiency in greenhouse culture.

Keywords: Azotobacter, Fertilizer efficiency, Zinc sulfate, Mycorrhiza.

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