

Effect of Nitrogen and/or Bio-Fertilizer on the Yield, Total Flavonoids, Carbohydrate Contents, Essential Oil Quantity and Constituents of Dill Plants

Authors : Mohammed S. Aly, Abou-Zeid N. El-Shahat, Nabila Y. Naguib, Huussie A. Said-Al Ahl, Atef M. Zakaria, Mohamed A. Abou Dahab

Abstract : This study was conducted during two successive seasons of 2000/2001 and 2001/2002 to evaluate the response of *Anethum graveolens* L. plants to nitrogen fertilizer with or without bio-fertilizer on fruits yield, total flavonoids and carbohydrates content, essential oil yield and constituents. Results cleared that the treatment of 60 Kg N/fed without and with bio-fertilizer gave the highest umbels number per plant through the two seasons and these increments were significant in comparison with control plants. Meanwhile, fruits weight (g/plant) showed significant increase with the treatments of nitrogen fertilizers alone and combined with bio-fertilizers compared with control plants in the first and second season. Maximum increments were resulted with the previous treatment (60 Kg N/fed). Fruits yield (Kg/fed) revealed the same trend of fruits weight (g/plant). Total flavonoids contents were significantly increased with all of used treatments. Maximum increase was noticed with bio-fertilizers combined with 60 Kg N/fed during two seasons. Total carbohydrate contents showed significant increase with applied nitrogen fertilizers treatments as alone, meanwhile total carbohydrate contents were increased non-significantly with the other used treatments during the two seasons in comparison with control plants content. The treatment of bio-fertilizer and in most of nitrogen fertilizer levels significantly increased essential oil percentage, content and yield. The treatment of 60 Kg N/fed with or without bio-fertilizer gave the best values. All identified compounds were observed in the essential oil of all treatments. The major compounds were limonene, carvone and dillapiole. The most effective fertilization on limonene content was 40 Kg N/fed and/or bio-fertilizers. Meanwhile 20 Kg N/fed with or without bio-fertilizers increased carvone, but most of fertilization treatments except those of bio-fertilizers and 40 Kg N/fed increased dillapiole content.

Keywords : carbohydrates, dill, essential oil, fertilizer, flavonoids

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