

Oil yield and fatty acid profile of *Oenothera biennis* as affected by different levels of nitrogen and zinc fertilization

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A field experiment was conducted with *Oenothera biennis* to evaluate the effects of nitrogen fertilizer and zinc spray on the plant height, branches and capsule numbers, seed yield, seed oil content and fatty acid composition. Plant height, branches and capsule numbers, seed yield and seed oil content of *O. biennis* increased significantly with the rise in nitrogen fertilizer and zinc spray levels. The maximum levels of plant height, branches and capsules numbers were obtained from plants fertilized with 30 (kg N/fed) combined with zinc spray (400 ppm). The maximum values of seed yield (g/plant; kg/fed) and seed oil yield (kg/fed) were obtained from plants fertilized with 60 (kg N/fed) combined with zinc spray (400 ppm). In addition, the maximum level of oil percentage was obtained from plants fertilized with 60 (kg N/fed) combined with zinc spray (200 ppm). The results of fatty acids composition from *O. biennis* oil showed non-specific trend to the effect of the treatments under study on the profile of fatty acids. High levels of unsaturated fatty acids (~ 90%) were found in the oil samples, while saturated fatty acids (~ 10%) were found in lower levels. In general, polyunsaturated fatty acids (PUFA, ~ 81%); monounsaturated fatty acids (MUFA, ~ 9%) and saturated fatty acids (SFA, ~ 10%) were measured in oil samples. The predominant fatty acids in *O. biennis* oils were linoleic acid (C18:2n-6, 71.2-71.7%) followed by γ -linolenic acid (C18:3n-6, 9.7-9.9%), oleic acid (C18:1n-9, 8.1-8.5%), palmitic acid (C16:0, 6.2-6.7%), stearic acid (C18:0, 2.7-3.0%), arachidic acid (C20:0, 0.4-0.5%), gondoic acid (C20:1n-9, 0.5-0.6%) and behenic acid (C22:0, 0.1-0.2%).

Keywords: Evening primrose, zinc spray, nitrogen fertilizer, fatty acid, morphological characters, seed yield.

Abbreviations: SFA: Saturated fatty acids; MUFA: Monounsaturated fatty acids; PUFA: Polyunsaturated fatty acids; fed: Feddan (= 0.42 hectares or 1.038 Acres)

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