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رقم البحث: السادس

Compost Improving Morphophysiological and Biochemical Traits, عنوان البحث باللغة الإنجليزية: Seed Yield, and Oil Quality of *Nigella sativa* under Drought Stress.

الباحثون المشاركون:

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ملخص البحث باللغة الإنجليزية:

This study aimed to determine the effects of compost amendment on soil properties, as well as the morphophysiological responses, seed yield, oil content, and fatty-acid profile. Of *Nigella sativa* plants under drought stress conditions. In a split-plot design, the field experiment was carried out during two seasons (2020/2021 and 2021/2022), involving three irrigation regimes (named I100, I75, and I50 of crop evapotranspiration) with three levels of compost application (C0, C15, and C30). Soil porosity, permeability, pore geometry, water-holding capacity, organic content, and soil cation exchangeable capacity were improved in response to applied compost levels. The growth, physiology, biochemistry, and yield characteristics of *Nigella sativa* plants were positively affected by compost addition but negatively affected by increasing water stress severity. Deficit irrigation regimes increased Osmo protectant substances (i.e., proline, total free amino acids, carbohydrates, and total soluble sugar). Compared to the control (I100), deficit irrigation (I50) reduced fixed and essential oil by 16.64% and 39.57% over two seasons. Water stress increased the content of saturated fatty acids, while unsaturated fatty acids decreased. Compost application of (C30) resulted in a significant increase in seed yield, fixed oil, and essential oil of *Nigella sativa* plants by 34.72%, 46.55%, and 58.11% respectively, compared to the control (C0). Therefore, this study concluded that compost amendment improved soil properties and significantly mitigated the detrimental effects of drought on *Nigella sativa* plants, resulting in a considerable increase in seed yield and its oil content, particularly polyunsaturated fatty acids, which are distinguished by their beneficial effects on human health.