Effects of petroleum hydrocarbon levels on morphological and physiological characteristics of two bermudagrass species

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Abstract

Petroleum hydrocarbons (PHs) are one of the most important soil contaminants. Presence of these compounds in soil may cause some stresses to plants and make the growth conditions unfavorable. Thus, for landscaping in the contaminated areas, tolerant plants to these stresses are needed. The aim of this research was to determine morphophysiological characteristics of two native and non-native bermudagrass species in a soil with 0, 2.1, 3.87 and 12.25 percent by weight PHs:soil. A factorial experiment, based on randomized complete blocks design with three replications, was performed in research greenhouse of College of Agriculture, Isfahan University of Technology, Isfahan, Iran. Results showed that application of 2.1% PHs to soil significantly reduced color and density of bermudagrasses (3.3% and 5%, respectively), and the growth of native and non-native species was reduced by 31.1% and 7.3%, respectively. Relative water content and chlorophyll content were significantly decreased and proline content was increased, when soil pollutant content by PHs was increased. Also, the increase in contaminants content up to 2.1% increased catalase activity. But, higher rates of contamination reduced its activity, as compared to control. Conclusively, both bermudagrass species had acceptable turf quality and therefore could be recommended to be used in PHs-polluted soils; although quality and growth of non-native bermudagrass was better than the native one.

Keywords: Petroleum contaminants, Bermudagrass, Catalase enzyme.

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