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Determining Water Use Efficiency of Mung Bean (Vigna radiata L.) under Arid Climatic Conditions

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Abstract : Water limitation is undoubtedly a critical environmental constraint limiting the crop production under arid and semiarid areas. Mung bean is susceptible to both drought and water logging stresses. Therefore, present study was conducted to assess the water deficit stress consequences of yield components and water use efficiency in Mung bean. A field experiment was conducted at Educational Farm, Crop Production Department, College of Food and Agricultural Sciences, Kind Saud University, Saudi Arabia. Trail comprised of four irrigation levels — total amount of irrigation divided into irrigation intervals — (3, 5, 7 and 9 days interval) and three Mung bean genotypes; Kawmay-1, VC-2010 and King from Egypt, Thailand and China respectively. Experiment was arranged under split plot design having irrigation as main while genotype as subplot treatment, and replicated thrice. Plant height, 100 seed weight, biological yield, seed yield, harvest index and water use efficiency were recorded at harvesting. Results revealed that decrease in irrigation have significantly hampered all the studied parameters. Mung bean genotypes have also shown significant differences for all parameters, whereas irrigation genotype interaction was highly significant for seed yield, harvest index and water use efficiency (WUE) while it was significant for biological yield. Plant height and 100 seed weight were recorded non-significant for irrigation genotype interaction. A statistically highly significant correlation among recorded parameters was observed. Minimum irrigation interval (3 days) significantly produced maximum values while VC-2010 comparatively performed better under low irrigation levels. It was concluded that Mung bean may be successfully adopted under Saudi Arabian climate but it needs high water or frequent irrigation, however, genotypic differences are a hope to develop some improved varieties with high water use efficiency.

Keywords : mung bean, irrigation intervals, water use efficiency, genotypes, yield
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