عنوان مقاله:

Efficacy of Ascorbic Acid as A Cofactor to Increase Irrigation Water-Use Efficiency (IWUE) and Mung Bean (Vigna Radiata L.) Yield

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خلاصه مقاله:

Ascorbic Acid (AsA) is a water-soluble antioxidant that makes plants resistant to environmental stresses by neutralizing free radicals. However, it is unknown to what extent this antioxidant may help Improve Irrigation Water Use Efficiency (IWUE) and reduce the adverse effects of water deficit on mung bean growth and yield. In an attempt to clarify whether exogenous application of this antioxidant could alleviate the adverse effects of water deficit on mung bean plants, two seasons (۲۰۱۹ and ۲۰۲۰) of field experiments were conducted using twelve combinations of three AsA levels (distilled water as a control and ۱۰ and ۲۰ mM of AsA) and four irrigation water amounts (۲۵, ۵۰, ۷۵, and ۱۰۰% of the plant water requirement). Based on the results, the maximum IWUE was obtained with W۵۰AsA۲۰ in the two seasons. The beneficial effect of AsA application on IWUE was determined under water stress conditions (W۵۰). High water deficit (W۵۰) plus applying ۲۰ mM ascorbic acid, i.e. W(۵۰)AsA(۲۰) treatment, improved seed yield about ۴۳.۷% as in the two seasons compared to high water deficit without ascorbic acid, i.e. W(۵۰)AsA(۰). In ۲۰۱۹ and ۲۰۲۰, water saving in W(۵۰)AsA(۲۰) compared to the control, was equal to ۵۰% (۲,۵۵۰ and ۲,۵۰۰ m۳ ha-۱, respectively). In W(۵۰)AsA(۲۰) treatment, the increase of seed yield ranged between ۷۹-۱۰۷% in both seasons. .Thus, the results reveal the potency of AsA to save water under low water supply and increase yield in mung bean fields

کلمات کلیدی:

.Mung Bean yield, Water deficit, Water saving