عنوان مقاله:

The effect of exogenous silicon on seed germination and seedling growth of wheat cultivars under salt stress conditions

محل انتشار:

دوفصلنامه تحقیقات کشاورزی ایران, دوره 35, شماره 2 (سال: 1395)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

ABSTRACT- Seed germination and early seedling growth are critical stages for plants establishment and production, particularly under salinity conditions. Exogenous application of silicon (Si) can enhance germination as well as seedling growth. In this experiment, the effect of priming with Si (۰, ۰.۷۵, ۱.۵ and ۲.۲۵ mM sodium silicate) on seed germination and seedling growth under NaCl (۰, ۱۰۰ and ۱۵۰ mM) conditions was studied in two wheat cultivars of Kavir (salt tolerant) and Shiraz (salt sensitive). The experiment was designed as a factorial based on completely randomized design with three replications in the laboratoryof college of Agriculture, Shiraz University, in ۲۰۱۲. Results showed that seed priming by Si improved germination percentage, germination rate, vigor index, shoot and root length and seedling dry weight in both stress and non-stress conditions. Moreover, Si increased K+ uptake and K+/Na+ ratio and decreased Na+ content of cultivars with the effect of ۲.۲۵ mM being more pronounced. On the contrary, salt stress reduced the above traits andK+ uptake and K+/Na+ ratio and increased mean germination timeand Na+ uptake in both cultivars with the negative effects of ۱۵۰ mMNaCl being more severe. However, the tolerant cultivar (Kavir) accumulated less Na+ and more K+ and had greater K+/Na+ ratio compared to non-tolerant cultivar (Shiraz). Although the salinity adversely affected seed germination and seedling growth in both cultivars, Kavir (tolerant cultivar) was less affected. It was concluded that priming with Si may promote germination and subsequent seedling growth of wheat cultivars under salinity conditions by reducing Na+ in favor of K+ accumulation.

کلمات کلیدی:

Keywords:, Wheat, Silicon, Salinity, Germination, Seedling growth