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Foliage applied selenium improves photosynthetic efficiency, antioxidant potential and wheat productivity under drought stress. (2020).
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Abstract

Selenium (Se) has been extensively reported to alleviate negative effects of abiotic stresses, including drought on several economic plants. This study was conducted to evaluate the effects of foliar application of Se with three levels (0 (Se₀), 25 (Se₂₅), and 50 (Se₅₀) mM) on water status, photosynthetic efficiency, antioxidative defense apparatus, and productivity of wheat sown under three deficit irrigation (DI) levels i.e., DI₀, DI₂₀, and DI₄₀ of crop evapotranspiration (ET_c) during 2017–18 and 2018–19. DI₀, DI₂₀, and DI₄₀ referred to 100, 80 and 60% of ET_c, respectively. Foliar application of Se₂₅ and Se₅₀, under normal and drought conditions, significantly increased the leaf tissue's succulency, chlorophyll contents, photosynthetic efficiency, antioxidant defense system components and osmoprotectants. Maximum grain yield and related attributes of wheat were recorded when Se was applied under normal and drought stress conditions. The highest grain yield was recorded when Se₅₀ and Se₂₅ were applied under normal condition (DI₀) in both seasons, respectively, while under drought stress conditions, the highest grain yield was obtained when Se₂₅ or Se₅₀ combined with DI₂₀ level in both seasons. DI₄₀ × Se₂₅ compared to DI₀ × Se₀ recorded the best results of water use efficiency (WUE) based on grain yield, exceed by 80.8 and 74.7% in both seasons, respectively. In conclusion, drought stress impaired the wheat productivity while foliar application of Se (25 or 50 mM) considerably improved wheat yield and WUE of wheat due to notable expansion in gas exchange traits and antioxidant potential of wheat subjected to drought stress.

عميد الكلية

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