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Influence of seed priming on morpho-physiological traits associated with drought tolerance in maize

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Abstract

Maize (*Zea mays* L.) is one of the most important grain crops in Pakistan and is produced throughout the country under diverse environmental conditions. The maize crop faces many drastic abiotic challenges, but drought is considered the most alarming factor that reduces plant growth and yield. Seed priming is a well-known method and most adapted mechanism that mitigates drought stress and ultimately enhances the growth development as well as grain yield of plants. The objective of the present study was to assess the effect of different seed priming approaches on plant growth and development in maize in addition to evaluate the potential of various seed priming techniques for mitigating drought stress in maize. By keeping these facts in mind, a pot experiment was conducted under a completely randomized design under natural conditions to study the influence of different priming agents on morpho-physiological characters related to water deficit conditions in maize. Seed priming agents developed drought tolerance mechanisms in maize plants which ultimately enhanced the morpho-physiological parameters and gradually increased growth development in early stage of development. The obtained data were analyzed through ANOVA and variations between all the parameters of both maize varieties were measured at 5% probability level. It was concluded that both varieties of maize through morpho-physiological attributes showed best behavior under seed primed conditions. Overall variety Pak-Afgoi responded well to the seed priming approach to mitigate the drought stress in maize. Moreover, the results demonstrated clear and significant impact of seed priming on both maize varieties under drought stress for various characters under study. Conclusively, based on the present study, the seed priming may lead to enhanced drought tolerance in maize.

Keywords: Maize growth, seed priming, drought tolerance, morpho-physiological traits, crop management, abiotic stresses

