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Priming Enhances tolerance to Waterlogging Stress in Turmeric Varieties (*Curcuma longa* L.)

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Waterlogging (S) is one of the major abiotic stresses limiting turmeric growth, yield and stability in areas with excessive rainfall. In this study, three different rhizome priming techniques—hydropriming (H), halopriming (N), and KNO3 priming (K)—were used as an attempt to increase the water logging tolerance in two turmeric varieties, Prathibha (T) and Pragati (G). In contrast to the control, primed-waterlogged plants maintained their growth and yield on the fourth day following two days of waterlogging. The results showed that waterlogging treatment significantly raised levels of carbohydrates, protein, proline and H2O2, and decreased levels of MDA, demonstrating turmeric's high resistance to waterlogging stress. It also showed that waterlogging treatment did not reduce the amount of photosynthetic pigment. Hydro-primed Prathibha under stress (THS) and KNO3-primed Pragati under stress (GKS) had the highest photosynthetic pigment and protein content. Proline content was found to be higher in both primed waterlogged turmeric varieties, while Pragati had a higher concentration. Carbohydrate content was lower in the leaves of primed waterlogged plants but was found higher in roots. The yield was higher in primed turmeric varieties and waterlogging did not significantly reduced it. The highest yield was found in halo-primed Pragati (GN).When all applications were compared with the control, the primed Prathibha varieties were less affected by waterlogging and more tolerant than the others. The present study suggested that rhizome priming is an alternative and more effective method to increase tolerance in turmeric varieties when exposed to waterlogged conditions.

KEYWORDS: Priming, Tolerance, Turmeric, Waterlogging.