

## Physiological and Biochemical Based Analysis to Assess the Efficacy of Mulch under Partial Root Zone Drying in Wheat

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**Abstract :** Among the various abiotic stresses, drought stress is one of the most challenging for field crops. Wheat is one of the major staple food of the world, which is highly affected by water deficit stress in the current scenario of climate change. In order to ensure food security by depleting water resources, there is an urgent need to adopt technologies which result in sufficient crop yield with less water consumption. Mulching and partial rootzone drying (PRD) are two important management techniques used for water conservation and to mitigate the negative impacts of drought. The experiment was conducted to screen out the best-suited mulch for wheat under PRD system. Two water application techniques (I1= full irrigation I2= PRD irrigation) and four mulch treatments (M0= un-mulched, M1= black plastic mulch, M2= wheat straw mulch and M4= cotton sticks mulch) were conducted in completely randomized design with four replications. The treatment, black plastic mulch was performed the best than other mulch treatments. For irrigation levels, higher values of growth, physiological and water-related parameters were recorded in control treatment while, quality traits and enzymatic activities were higher under partial root zone drying. The current study concluded that adverse effects of drought on wheat can be significantly mitigated by using mulches but black plastic mulch was best suited for partial rootzone drying irrigation system in wheat.

**Keywords :** antioxidants, leaf water relations, Mulches, osmolytes, partial root zone drying, photosynthesis

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