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**Methionine promotes the growth and yield of wheat under water deficit conditions by regulating the antioxidant enzymes, reactive oxygen species, and ions****Naila Inayat***Woman University, Pakistan*

The individual application of pure and active compounds such as methionine may help to address water scarcity issues without compromising the yield of wheat. As organic plant growth stimulants, amino acids are popularly used to promote the productivity of crops. However, the influence of the exogenous application of methionine in wheat remains elusive. The present investigation was planned in order to understand the impact of methionine in wheat under drought stress. Two wheat genotypes were allowed to grow with 100% field capacity (FC) up to the three-leaf stage. Twenty-five-day-old seedlings of two wheat genotypes, Galaxy-13 and Johar-16, were subjected to 40% FC, denoted as water deficit-stress (D), along with 100% FC, called control (C), with and without L-methionine (Met; 4 mM) foliar treatment. Water deficit significantly reduced shoot length, shoot fresh and dry weights, seed yield, photosynthetic, gas exchange attributes except for transpiration rate (E), and shoot mineral ions (potassium, calcium, and phosphorus) in both genotypes. A significant increase was recorded in superoxide dismutase (SOD), catalase (CAT), hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), malondialdehyde (MDA), and sodium ions (Na<sup>+</sup>) due to water deficiency. However, foliar application of Met substantially improved the studied growth, photosynthetic, and gas exchange attributes with water deficit conditions in both genotypes. The activities of SOD, POD, and CAT were further enhanced under stress with Met application. Met improved potassium (K), calcium (Ca<sup>2+</sup>), and phosphorus (P) content. In a nutshell, the foliar application of Met effectively amended water deficit stress tolerance by reducing MDA and H<sub>2</sub>O<sub>2</sub> content under water deficit conditions in wheat plants. Thus, we are able to deduce a positive association between Met-induced improved growth attributes and drought tolerance.

**Biography**

Naila Inayat has completed her PhD at the age of 29 years from University of Peshawar. She is Assistant Professor at Shaheed Benazir Bhutto Woman University Peshawar, KPK, Pakistan. She has published 19 papers in reputed journals and more than 9 papers are under review process.