

Impact of Rising Atmospheric Temperature on Wheat

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Abstract: Since the industrial revolution, temperatures have been steadily rising over the world at a pace of 0.15 to 0.17°C every decade. The productivity of agricultural crops is being impacted. To maintain crop output under increased temperatures, thermotolerance measures are therefore required. More than 80% of the world's population relies on wheat, a significant grain crop, as a source of essential protein and calories. Concerns about how rising temperatures could affect wheat output due to recent global climate change are spreading around the globe. Abiotic stressors such as heat and drought are what primarily limit wheat productivity. Under projected future climatic scenarios, extreme weather events (such as frost and heat shock), which presently pose a considerable burden to grain growers, are expected to get worse. The crucial physiological and biochemical processes of the plant are halted by heat stress. Stress brought on by high temperatures decreases the quantity of grains, photosynthetic activity, chlorophyll content, and endosperm starch synthesis. The high temperature has a negative impact on the phenology, growth, and development of the crop. The pollen viability, seed germination, and embryo development are all slowed down by the high temperature before anthesis. The accumulation of starch granules, stem reserve carbohydrates, and photosynthate translocation into grains are all reduced by the high postanthesis temperature. A temperature above 40°C prevents photosynthesis from happening by harming photosystem-I, photosystem-II, and the electron transport chain. The crop suffers significant oxidative damage when reactive oxygen species that have accumulated due to heat stress. In order to reduce the effects of heat stress, plants quickly synthesise heat shock proteins.

Keywords: Atmospheric Temperature.

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