

Evaluation of Wheat Varieties on Water Use Efficiency under Staggering Sowing times and Variable Irrigation Regimes under Timely and Late Sown Conditions

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Abstract : The agricultural productivity is challenged by climate change and depletion in natural resources, including water and land, which significantly affects the crop yield. Wheat is a thermo-sensitive crop and is prone to heat stress. High temperature decreases crop duration, yield attributes, and, subsequently, grain yield and biomass production. Terminal heat stress affects grain filling duration, grain yield, and yield attributes, thus causing a reduction in wheat yield. A field experiment was conducted at Indian Agricultural Research Institute, New Delhi, for two consecutive rabi seasons (2017-18 and 2018-19) on six varieties of wheat (early sown - HD 2967, HD 3086, HD 2894 and late sown - WR 544, HD 3059, HD 3117) with three moisture regimes (100%, 80%, and 60% ETc, and no irrigation) and six sowing dates in three replications to investigate the effect of different moisture regimes and sowing dates on growth, yield and water use efficiency of wheat for development of best management practices for mitigation of terminal heat stress. HD3086 and HD3059 gave higher grain yield than others under early sown and late sown conditions, respectively. Maximum soil moisture extraction was recorded from 0-30 cm soil depth across the sowing dates, irrigation regimes, and varieties. Delayed sowing resulted in reducing crop growth period and forced maturity, in turn, led to significant deterioration in all the yield attributing characters and, there by, reduction in yield, suggesting that terminal heat stress had greater impact on yield. Early sowing and irrigation at 80% ETc resulted in improved growth and yield attributes and water use efficiency in both the seasons and helped to some extent in reducing the risk of terminal heat stress of wheat grown on sandy loam soils of semi-arid regions of India.

Keywords : sowing, irrigation, yield, heat stress

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