

Irrigation Scheduling for Wheat in Bangladesh under Water Stress Conditions Using Water Productivity Model

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Abstract : Proper utilization of water resource is very important in agro-based Bangladesh. Irrigation schedule based on local environmental conditions, soil type and water availability will allow a sustainable use of water resources in agriculture. In this study, the FAO crop water model (AquaCrop) was used to simulate the different water and fertilizer management strategies in different location of Bangladesh to obtain a management guideline for the farmer. Model was calibrated and validated for wheat (*Triticum aestivum* L.). The statistical indices between the observed and simulated grain yields obtained were very good with R², RMSE, and EF values of 0.92, 0.33, and 0.83, respectively for model calibration and 0.92, 0.68 and 0.77, respectively for model validations. Stem elongation (jointing) to booting and flowering stage were identified as most water sensitive for wheat. Deficit irrigation on water sensitive stage could increase the grain yield for increasing soil fertility levels both for loamy and sandy type soils. Deficit irrigation strategies provides higher water productivity than full irrigation strategies and increase the yield stability (reduce the standard deviation). The practical deficit irrigation schedule for wheat for four different stations and two different soils were designed. Farmer can produce more crops by using deficit irrigation schedule under water stress condition. Practical application and validation of proposed strategies will make them more credible.

Keywords : crop-water model, deficit irrigation, irrigation scheduling, wheat

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