

Improving agricultural water productivity in the Indira Gandhi Nahar Pariyojana (IGNP)

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Abstract

ICARDA and CAZRI have recently concluded a 6-year research study on investigation of avenues to improve agricultural water productivity in the INGP canal command area. The study was conducted in stages I and II of the canal command area - stage I has predominantly cereal-based production systems under surface irrigation and stage II has pressurized irrigation-based cash crop production. The study measured present levels of biophysical and economic land and water productivity for individual crops and cropping systems. Using two years of crop production, management practice and soil-water balance data, CropSyst model was calibrated and validated for each crop for both stages of command area. There was good to excellent agreement between observed and predicted data on yield, biomass, LAI, soil moisture, initiation of different crop growth stages and nitrogen uptake. Calibrated model was then applied for simulating different nitrogen and irrigation application scenarios using a 30-year weather dataset. Targeted separate recommendations are presented for each crop on how decision makers can improve agricultural water productivity in the command area.

Keywords: Crop modeling, Resource-use optimization, Water productivity