Evaluation of Ceres Wheat and Rice Model for Climatic Conditions in Haryana, India

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Abstract : The simulation models with its soil-weather-plant atmosphere interacting system are important tools for assessing the crops in changing climate conditions. The CERES-Wheat & Rice vs. 4.6 DSSAT was calibrated and evaluated for one of the major producers of wheat and rice state- Haryana, India. The simulation runs were made under irrigated conditions and three fertilizer applications dose of N-P-K to estimate crop yield and other growth parameters along with the phenological development of the crop. The genetic coefficients derived by iteratively manipulating the relevant coefficients that characterize the phenological process of wheat and rice crop to the best fit match between the simulated and observed anthesis, physological maturity and final grain yield. The model validated by plotting the simulated and remote sensing derived LAI. LAI product from remote sensing provides the edge of spatial, timely and accurate assessment of crop. For validating the yield and yield components, the error percentage between the observed and simulated data was calculated. The analysis shows that the model can be used to simulate crop yield and yield components for wheat and rice cultivar under different management practices. During the validation, the error percentage was less than 10%, indicating the utility of the calibrated model for climate risk assessment in the selected region.

Keywords : simulation model, CERES-wheat and rice model, crop yield, genetic coefficient

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