Article

Application of DSSAT crop model for wheat crop growth simulation in some wheat growing districts of northern India

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Abstract
Process based Crop growth simulation models are being used as a potential decision support tool for informed decision making by policy makers and researchers. Calibration and validation of a crop growth simulation model is the fundamental process before applying the model projections to a new location. CERES crop growth simulation model has been used by a number of researchers worldwide to simulate wheat growth. This study is undertaken to calibrate and validate CERES model on DSSAT (Decision Support System for Agro Technology Transfer) platform for six predominantly wheat growing districts of Northern India.

Keywords crop simulation model; DSSAT; CERES; phenology; leaf area index.

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1 Introduction

Crop simulation models integrate the interdisciplinary knowledge gained through field experimentation and technological innovations in the fields of biological, chemical and physical science relating to agricultural production system. Therefore, these models can increase understanding and management of the agricultural system in a holistic way. Crop simulation models have been used to investigate the performance of different cultivars at a range of sowing dates in relation to different soil and climate scenarios. The Decision Support System for Agro Technology Transfer (DSSAT4.5) is a comprehensive decision support system that includes the Cropping System Models CERES-wheat.The CSM-CERES-Wheat, a part of Decision Support System for Agrotechnology Transfer (DSSAT) Cropping System Model V4.5, has been used in this study. The model has been documented extensively since its initial development and evaluation. The ability of DSSAT to evaluate management and genetic options is a potential tool for studying the impacts of climate change and assessing useful adaptation strategies to mitigate the potentially negative effects of climate variability such as sowing date, row spacing, plant density, irrigation and fertilization. It has been successfully employed over the last 20 years worldwide in many range of applications, including climate change, precision agriculture and crop

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