

Article title	Spatial Crop Modeling and Decision Support Tool
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Abstract	<p>Interactive spatial crop modeling and decision support tool (GSSAT) is the Graphical User Interface to the Cropping System Model (CSM) of DSSAT (Decision Support System for Agrotechnology Transfer) with extended functionality. It allows climate information and management options analysis for crop production by running different field based crop models for over 40 crops on a spatial scale. Various spatial data sets such as soil databases containing information on soil type and distribution for a region as GIS shape files, climate station information with data on synthetic or observed weather data, soil initial conditions, experimental details and other information can be used as the input. The tool first dynamically generates new experimental details files based on the provided input data, then using them drives the CSM model spatially and finally, provides a framework for analyzing outputs from the polygon based regional level simulations. The results of the simulations based on various scenarios such as planting date, irrigation and fertilizer management are visualized as thematic maps with this interactive DSS. An entire area or sub-area can be selected based on the SQL query criteria by selection of a specific variable when creating maps for spatial analysis. The tool also has extended functionalities by integrating biophysical and economic analysis utilities. All biophysical outputs can be mapped, along with the most economically efficient treatment (created by a gross margin analysis coupled with Mean-Gini analysis), driven by a localized cost-price file. When fully populated with detailed data, GSSAT can accurately describe cropping systems development and allows various stakeholders estimate agricultural input efficiency and thus, reduce risk associated with production. We are demonstrating GSSAT functionality for case studies conducted for the West African countries (Burkina Faso and Ghana) on estimation of the potential of rainfed maize production for various “planting date-fertilizer applications” scenarios.</p>
Publication date	2019-11-13
Article link	<a href="https://scisoc.confex.com/scisoc/2019am/meetingapp.cgi/Paper/120210">https://scisoc.confex.com/scisoc/2019am/meetingapp.cgi/Paper/120210</a>