Process Crop Models: GOSSYM/COMAX

Description	GOSSYM/COMAX is a mechanistic cotton growth model and expert system that simulates cotton growth given selected weather, soil, and management practices. Management options include fertilizer and irrigation strategies. GOSSYM operates on daily time steps and calculates material balances for water and nitrogen using weather and soil data to predict crop growth and crop yield. The model also calculates material balances and soil nitrogen uptake.
Appropriate Use	Effective aid to cotton growers, crop consultants, and researchers in the management of irrigation water, nitrogen, plant growth regulators, and crop termination chemicals. Useful in computing irrigation, planting time, and fertilization strategies for farmers; can be used in conjunction with GCMs or WGEN to examine the effects of changes in climate on crop production. Does not work well with intersecting insect data.
Scope	All locations; agricultural sector; site-specific.
Key Output	Crop yield and yield components.
Key Input	Soil moisture and bulk density for each soil horizon and weather data (temperature, wind speed, solar radiation, and humidity).
Ease of Use	Relatively easy to use despite significant data requirements.
Training Required	Requires some knowledge of soil and plant physiology, although a user with sufficient background can gain proficiency with a few days of training.
Training Available	Short training course offered (see Contacts below).
Computer Requirements	An IBM-compatible 486 with 4K of RAM and 80MB.
Documentation	Application manual available (see Cost below).
Applications	Has been used in Spain, Greece, China, The Philippines, Australia (modified), Cameroon, and Thailand as well as many states in the U.S.
Contacts for Tools, Documentation, Technical Assistance	Dr. James McKinion, USDA-ARS, Crop Simulation Unit, PO Box 536, Mississippi State, MS 39762, USA; Tel: +1.601.324.4375; Fax: +1.601.324.4371; e-mail: mckinion@cs.rumsu.ars.ag.gov.
Cost	Can be obtained free of charge by e-mailing sturner@ra.msstate.edu.
References	**McKinion, J.M., D.N. Baker, F.D. Whisler, and J.R. Lambert. 1989. Application of GOSSYM/COMAX system to cotton crop management. *Agricultural Systems* 31:55-65.** **Watkins, K.B., Y.C. Lu, and V.R. Reddy. 1998. An economic evaluation of alternative pix application strategies for cotton production using GOSSYM/COMAX. *Computers and Electronics in Agriculture* (20)3:251.**