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**