## Process Crop Models: International Consortium for Application of Systems Approaches to Agriculture (ICASA) — International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) Family of Models

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| ***Description*** | The ICASA-IBSNAT suite of process crop models is structured as a decision support system for agrotechnology transfer (DSSAT) and evaluating agronomic adaptations. The suite includes all CERES and GRO models plus the SUBSTOR potato model for simulating up to 16 crops (e.g., maize, wheat, barley, sunflower, sugarcane, chickpea, tomato, and pasture). The ICASA-IBSNAT DSSAT is a computer software program combining crop, soil, and weather data bases, management programs, and crop models and application programs to simulate multiyear outcomes of crop management strategies. Its crop simulation models have identical modules for the simulation of the soil, water, and nitrogen balances, an important factor in crop rotation simulations. A graphics program displays soil moisture and nitrogen by depth over time. Programs have been developed for spatial application of the crop models and linkage with geographic information systems (GIS). |
| ***Appropriate Use*** | Allows users to ask "what if" questions and simulate results related to improved understanding of the influence of season, location, and management on the growth processes of plants. Particularly useful for evaluating agronomic adaptations such as changes in planting dates and maturity classes of cultivars. |
| ***Scope*** | All locations; agricultural sector; site-specific, although can be extrapolated to a national level using GIS. |
| ***Key Output*** | Changes in crop yields and yield components relative to different climate change scenarios. |
| ***Key Input*** | Data on a site's soils, climate, and management. |
| ***Ease of Use*** | For trained agronomists, DSSAT training should only take a day to acquire skills to conduct simple simulations. |
| ***Training Required*** | Requires advanced knowledge of plant growth processes. The DSSAT, with its embedded models, was designed for use by trained agronomists. |
| ***Training Available*** | Fee-based training courses are offered regularly by IBSNAT (see Contacts below). |
| ***Computer Requirements*** | Any 486 or better PC compatible computer with 640K of RAM, minimu m free RAM of 590K, and a hard disk. Complete installation requires 25MB of disk space, DOS version 3.3 or later, a VGA graphic adapter or better, and a math coprocessor (recommended). |
| ***Documentation*** | Available at http://agrss.sherman.hawaii.edu/dssat. |
| ***Applications*** | Used by numerous countries in the U.S. Country Studies Program, including Egypt, Kazakhstan, and Uruguay. |
| ***Contacts for Tools, Documentation, Technical Assistance*** | Dr. James W. Jones, Dr. Johan Bouma, IBSNAT, 2500 Dole Street, Krauss 22, Honolulu, HI 96822 USA; Tel: +1.808.956.8858; Fax: +1.808.956.3421; e-mail: gordont@hawaii.edu. |
| ***Cost*** | US$495 for DSSAT Version 3.5. |
| ***References*** | Uehara, G. 1985. The International Benchmark Site Network for Agrotechnology Transfer. In *Wheat Growth and Modeling.* W. Day and R.K. Atkin (eds.). Plenum Publishing, New York, pp. 271-274. |