ICASA's Role in Sustainable Agriculture in the 21st Century

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Abstract

The agricultural community traditionally has been conservative. As a result, the adoption of new computer information technologies, such computer-based simulation models and decision support systems, has been somewhat slow. The International Consortium for Agricultural Systems Applications (ICASA) has been at the forefront of the application of these information technologies in agriculture. ICASA was the outcome of agricultural systems activities conducted by the Wageningen Agricultural University and the International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) Project. A few years ago, it was expanded to a general membership with no membership fees. The only commitment that members make to the consortium is to support the mission of ICASA and to contribute crop models or modules, computer-based tools and decision support systems for sharing among the ICASA members. One of the main activities of ICASA has been supporting training of potential users of crop models and decision support systems through regular training workshops, which are being held at the University of Georgia and other locations across the world. ICASA also supports data standards for weather, soil, and experimental data to facilitate sharing among model developers and ease of use for model users. ICASA has developed a data exchange, where experimental data can be posted (ICASA Data Exchange, IDE). ICASA members have free access to these data sets with the understanding that appropriate credit is provided. As financial resources are limited, information is shared via a central web site, i.e., www.ICASA.net, and a bulletin board, i.e., www.ICASAForum.net. One of the main decision support and modeling system supported by ICASA is the Decision Support System for Agrotechnology Transfer (DSSAT). DSSAT comprises crop simulation models for more than 25 agronomic crops. The models are based on the Cropping System Model (CSM) and include crop models for grain cereals (CERES), grain legumes (CROPGRO) and several other modules. The ICASA standards have been implemented in DSSAT to allow for consistent data preparation and analysis for crop model evaluations and applications with its associated tools. DSSAT and its associated crop models have been used extensively for studies associated with crop management, resources management, food security, climate change, climate variability, carbon sequestration, and many other applications. Most of these issues were important at the end of the previous century and will become even more important in the 21st century as the world population continues to grow and natural resources are becoming scarcer, especially water. There is, therefore, great potential to use DSSAT and similar systems to help provide options for decision makers at various levels, ranging from smallholder farmers to policy makers.