J 88 ✓ 85 to 88

1988/CS2L.

85/1040

CRC FINAL REPORT

CS2L - DEVELOPMENT OF SIRATAC MK II

CSIRO Division of Plant Industry, Cotton Research Unit, Narrabri.

Supervisor: A. B. Hearn.

This project started in 1981 funded by ACGRA. CRC assumed funding until the project terminated in 1986.

The aims of the project were:

* to link the SIRATAC fruit model to a water balance model and to a soil and plant nitrogen balance model.

* to make the SIRATAC fruit model sensitive to water and nitrogen stress.

* to develop an expert system that uses data from the enhanced fruit model for pest, irrigation and nitrogen management decision making.

Water Management.

The SIRATAC fruit model was successfully linked to the Ritchie water balance model. The resulting model was called OZCOT. It is being used for risk analysis and strategy evaluation for cotton irrigated with limited water supplies and for rain grown cotton (Hearn 1988 and 1990, Australian Cotton Conference). A list of OZCOT users is appended, showing the wide interest in the model. The model has been released for irrigation managment in the ***hydoLOGIC*** package. The content and application of OZCOT are currently being documented for publication by A. B. Hearn.

During the course of development of OZCOT a novel procedure, which has been published (Talpaz et al 1987, Ag Sys 23:107), was developed for using SIRATAC fruit counts to calibrate the model. A new aerodynamic term was also calibrated for the Penman combination equation.

Nitrogen Management.

The incorporation of nitrogen was not completed when the project terminated. This aspect was continued in project CS33L (A nitrogen model for cotton) which was later incorporated in CS50L (Managing Nitrogen for Cotton), both being greatly hindered by difficulty in recruiting a suitable scientist.

Expert System.

The third aim was not attempted but was incorporated in the SIRATAC Plus project which was financed mainly by the CSIRO Division of Information

Technology with a small contribution from CRC under project CS38L (Software Engineering of SIRATAC).

OZCOT MODEL USERS

Centre for Water Policy Research, University of New England.
Dr Norm Dudley, Mr Mike Bryant.
Investigation of regional reservoir management, and effects of SOI (El Nino) and Greenhouse.

University of Southern Queensland, School of Engineering.
Dr Mark Porter.
Use of model in CR&CD funded soil compaction and controlled traffic project.

University of Queensland, Department of Agriculture.
Dr M. K. Wegner, Mr Peter McVeigh.
Risks associated with irrigated and dryland cotton production at Dalby.

APSRU, Toowoomba (Agricultural Production Systems Research Unit - CSIRO/QDPI).
Drs R. Mc Cown, G. Hammer, D. Freebairn.
Incorporation of OZCOT in a multi-crop systems model.

Bureau of Rural Research, Canberra.
Dr Ann Hamblin.
Requested use of OZCOT for evaluation of potential for cotton production throughout Australia, but interest has waned.

QDPI, Emerald.
Ms S. McMeniman.
Economic evaluation of on farm water storage for tail water and storm water reticulation.

QDPI, Ayr.
Mr Steve Okerby.
Evaluation of prospects for cotton on the Burdekin and on the Atherton Table lands.

QDPI, Biloela.
Dr Ian Titmarsh.
development of pest managemeut strategies for low input rain grown cotton.

Sundry clients.
District Agronomists, Consultants, Soil Conservationists.
Requested runs of the model to provided various types of information.