

ABSTRACT

CPEST: An Expert System for Coffee Pests and Diseases

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The thesis describes CPEST, an expert system developed for computer assisted management of coffee pests and diseases in Jamaica. The knowledge base of CPEST has been built with the help of experts from relevant fields e.g. entomologists, plant pathologists. Although primarily developed for small island ecosystems, CPEST can be adapted globally, as coffee is generally grown on sloping lands.

The system's knowledge base has been developed after many knowledge acquisition sessions with multiple experts. By using a supervising expert, we avoid the problems usually associated with using multiple experts. CPEST uses forward chaining production rules to represent its knowledge. Production rules permit the relationships that make up the knowledge base to be broken down into manageable units. The development platform was wxClips, which combines a standard forward chaining production system CLIPS with tools to build a familiar windows graphical user-interface.

CPEST has about 40 screens, including data entry screens and simple text display screens. The text screens are the recommendation screens. They also have an explanation facility to show how the particular inferences were reached. The system has the capability to display pictures and has an option to print its recommendations or save them to a file.

CPEST was validated by comparing its recommendations with those of three experts including one who had not been involved in the construction of CPEST. In general, CPEST's recommendations were in agreement with those of all three experts. The system is yet to be implemented in field but with the acceptance of the system by the experts, we believe that CPEST is an important step towards formulating general principles for building agricultural expert systems.