THE TREATMENT IMPLEMENTATION ADVISOR:
A COMPONENT OF THE GypsES PROJECT

Michael C. Saunders and Michael A. Foster
Department of Entomology and Laboratory for AI Applications,
Pennsylvania State University, University Park, PA 16802

ABSTRACT

The treatment implementation advisor is one of the knowledge based advisory modules of GypsES, a knowledge system environment for decision support in gypsy moth management. Its function is to provide detailed advice on intervention tactics for gypsy moth: e.g. aerial and ground application of insecticides and microbials, inundative or augmentative releases of parasitoids, mating disruption, genetic control and silvicultural management. The specific objectives of this project for 1989-1990 were as follows:

1) To design a knowlege based treatment implementation advisor .
2) To develop a prototype for early assessment by domain experts and potential users.
3) To begin linkage of the implementation advisor with the integrated tools of GypsES (GIS, DBMS, user interface, etc.).

GypsEX, a knowledge based module for aerial application of pesticides and microbials against gypsy moth (also operational as a stand-alone expert system), was refined considerably through verification efforts in June 1989 in Gettysburg, PA (with Ag-Rotors) and in August 1989 at Penn State University.

An initial knowledge engineering session in Hamden, CT, on August 1 stimulated three important suggestions: include a **treatment evaluation** section, a **tutorial** on the efficacy and safety of each major pesticide and ground vs aerial application, and **state-specific rules** layered on top of a fundamental rulebase for aerial application and other intervention methods.

GypsES research group meetings in August gave rise to the concept of the **treatment unit**, defined as an area within a management or administrative unit that is homogeneous with respect to treatment implementation. For example, a management unit which borders on water may have to be divided into two or more treatment units; those near water would not be recommended for aerial application of diflubenzuron.

A prototype for GypsES developed in the hypermedium SuperCard was presented in Providence, RI, on October 3 to several members of the United States Forest Service. The linkage of the implementation advisor to the other knowledge based advisors and integrated tools of GypsES is currently being conceptualized and is indicated in the prototype. Two major suggestions developed from this meeting: present a mix of **tutorials** on proposed **new technology** juxtaposed with **practical heuristics similar to current practice**, and include **algorithms to handle probabilities and incomplete information** whenever appropriate and possible.

The knowledge base for treatment implementation can be divided into choice of intervention method, aerial application of pesticides/microbials, and alternatives to aerial application. The subset of the knowledge base for aerial application can be further subdivided into choice of spray material during aerial application, spray timing, spray block prioritization, calibration, and characterization. Progress is presented on the design and software implementation of each subset of the knowledge base.