Utah State University Extension
Integrated Pest Management
Mini-Grant Proposal 2003

Title: Optimal Codling Moth Control in Cache County Orchards Through Insect Trapping and Utilization of a Degree Day Model for Pesticide Application

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Situation Statement

The objectives for the 2002 IPM project were to monitor diverse orchard sites in Cache Valley for Codling Moth and Western Cherry Fruit Fly; collect temperature data from the sites and apply it to a degree-day model to identify optimal pesticide application; and educate producers and homeowners of the benefits of an IPM strategy to control fruit tree insects.

Climatic extremes in Cache Valley during the winter and again in the spring of 2002 significantly reduced the amount of apples in county orchards. While some producers in the southern end of the valley had about 5% of a normal crop, others in

No. Logan and River Heights had about 50%. Some varieties of apples were completely lost and other varieties produced a normal amount. The weather conditions were far from optimal to carry out this project.

In February, 2002 supplies for the project were distributed to the producers at a meeting with instruction to place the traps in the orchard and begin taking temperature readings around May. In retrospect, the instructions were not clearly outlined or written, so only two producers had traps out before the codling moth flight began. As soon as the catch was reported by these two producers, I quickly contacted the other producers and checked to see if they had traps out in the orchard and to begin recording temperatures.

The bio-fix date is important in applying the degree-day model for pesticide application. Each producer collected temperature data throughout July with the May 17th bio-fix date assigned to all locations. In 2003 all producers will have traps in the orchard by the first of May, or earlier if spring temperatures are warm, so that bio-fix is determined for each orchard location.

The first pesticide application date was predicted when 250 days had elapsed since the bio-fix. About a week before June 7, 2002, I shared the countywide information with the producers by phone or personal contact. The information was also relayed to the public through a newspaper article, given to garden centers and nurseries through a monthly newsletter, and left with the secretaries in the Extension office for those who called in. For the future, I have collected a list of people who are interested in this spray date and will e-mail the projected spray date to them next year.

The date varied according to temperatures, but without having a bio-fix for each orchard, we can=t be sure when temperature accumulation would have begun in different locations. Next year producers will have traps in the orchard by the first of May, or earlier if spring temperatures are warm.

Summer 2002, the information for codling moth control was shared with the public through the newspaper, phone calls to the Extension office, the diagnostic clinic, the Gardener=s Market on Saturday mornings, and through public speaking assignments. The Master Gardener training beginning in the fall also covered the

subject of fruit tree pests and an abbreviated version of how it can be accomplished by monitoring temperature and trapping.

Objectives

- $ Monitor representative orchard sites in the valley, ensuring diverse climatic conditions across the valley, for the advent of Codling Moth and Western Cherry Fruit Fly.
- $ Collect climatic data from orchard sites to use in the insect model to predict optimal pesticide application timing.
- $ Educate producers and homeowners of the environmental and economic benefits of an Integrated Pest Management strategy to control insect populations.

Procedures

The USU Extension Horticulturist, Cache County, will contact commercial producers in the county and see which producers are willing to continue with university Extension in monitoring insect populations and then applying pesticides according to predictions derived from the degree day model.

Pheromone traps for Codling Moth will be provided by Extension to the producers. A training session will be held prior to the growing season for cooperators and Master Gardener volunteers participating in the project. Codling moth control, as well as information about chemicals available for use will be discussed.

This training will include specific instructions of how the producers are to collect the data, as well as the theory behind the procedure. Information about the degree day model, an explanation of how it works, and a demonstration of timing pesticide application in relationship to the codling moth flight will help participants understand the theory behind the practice. Producers and Master Gardener volunteers will be responsible for checking traps and thermometers and subsequently reporting findings to the Extension Horticulturist or be collected by an assistant.

With data applied to the degree day model, pesticide applications for different sites in the valley will be provided to cooperating producers. In addition, pesticide

application dates will be provided to homeowners and commercial pesticide applicators throughout the valley via a web site, newspaper updates, nursery newsletters, and Master Gardeners who will answer gardening questions directed to the Extension office.

Currently fact sheets are available through the extension office and on the extension website which detail the process of insect control using degree day modeling. Cache Valley growers will have the opportunity to apply specific information derived from this study for representative sites in the county. Over a period of time, the data and information derived from this study will become part of a county data base to assist producers, homeowners, commercial pesticide applicators, and Master Gardener volunteers.

Trained Master Gardeners are instrumental in disseminating research information directly to the public through phone calls to the extension office, the weekly Cache Valley Gardeners Market, personal contacts, and public speaking assignments. The information derived from this study will become part of the Master Gardener education classes and advanced Master Gardener training each year in Cache County. A single page describing the insect and management through pesticide applications will be compiled by the Extension agent. A portion of a class presented in Master Gardener training will consist of a discussion of the degree day model, how it is used to predict optimal spray application timing for the control of codling moth, and the resulting environmental benefits to the public.

At season=s end an informal field day will be scheduled to evaluate the usefulness of the information gleaned from data collected through the summer. Producers will have the opportunity to share results with each other and report successes and weaknesses from the project. Ideally, this process would continue from one season to the next with commercial producers, and the data would be of benefit to both themselves and the general public in reducing the amount of pesticides released into the environment.

Budget

Pheromone traps (codling moth)	$ 122.50 (35 @ 3.50 each)
Maximum/minimum thermometers	$ 49.50 (1 @ 49.50 each)
Wages - assistant	$ 400.
Travel	$ 200.
Training session	$ 50.
Field day for commercial producers	$ 50.
Total	$ 872.

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