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CCM -- Where Are We Headed?

In the past several years we have successfully developed several models of insect phenology that we believe will aid in the monitoring and management of cranberry pests. These models predict the seasonal occurrence of various stages of cranberry insects with relative accuracy. Most of this research was conducted by Dr. Steve Cockfield working in my lab; our research was supported by a grant from Ocean Spray.

For the past few years our intent has been to develop the best possible method for providing these models, and other pest management information, to the cranberry industry. We have settled on a computer-oriented delivery approach as our focus. This decision was based on several factors, some of which include:

- the models require computational abilities, some of which are complex;
- the models require storage of data, such as temperatures, trap counts, etc.;
- pest management is increasingly dependent on a knowledge base and good record keeping;
- today's computers are powerful and inexpensive, and capable of sophisticated record keeping and data management; and
- an increasing number of cranberry operations use computers as a normal tool in farm management.

About three years ago we first conceived the idea of a cranberry pest management computer software package, which we call **Cranberry Crop Manager**, or simply **CCM**. Two years ago we released a very crude pilot prototype with the model for blackheaded fireworm egg hatch. This prototype was funded and developed by the UW-Extension IPM Program. Since that time, we have been planning the entire **CCM** package and attempting to secure funding to continue the project. I am pleased to say that Ocean Spray has agreed to fund the first year of a projected two-year program to get the first full version of **CCM** produced and released to the industry. We have just hired a part-time programmer, Mr. Paul Kaarakka, who will be working within the Extension IPM Program computer staff. Paul has considerable experience in developing **WISDOM**, a similar program for the vegetable industry.

The full version of **CCM** will be a sophisticated pest and crop management tool, capable of receiving, storing, and analyzing pertinent data, as well as suggesting specific management actions. The types of data that can be entered on-farm include temperature, rain, irrigation, date of ice-off, and pest scouting data such as sweep samples and trap catches.

CCM will have several models that will use these data to calculate specific pest and crop activity. Individual models include (1) blackheaded fireworm (BHFW) overwintering egg hatch, (2) BHFW first generation larval development, (3) prediction of percent flight and percent egg laying of BHFW, (4) summer egg hatch of BHFW, (5) summer BHFW larval development, (6) cranberry girdler flight phenology, (7) sparganothis fruitworm flight phenology, (8) cranberry tipworm egg laying, (9) plant budbreak, and (10) percent in and out of bloom. Other potential models include evaporation, irrigation scheduling, temperature prediction, dodder germination, and cottonball

phenology. In addition to the models, the program will have an encyclopedia of pest

and crop management information. "Pest Profiles" for each insect pest will include information on life cycle, phenology, description, distribution, damage, monitoring methods, and controls. "Pesticide Profiles" will have information on type of material, manufacturer, chemical group, type of action, formulations registered on cranberry, application methods, rate per acre, application restrictions, health and safety precautions, environmental precautions, compatibility, and general usage comments. Eventually, Pest Profiles will include weeds and plant pathogens and Pesticide Profiles will include herbicides and fungicides. **CCM** will also have a library of color photographs of pests and their damage (that's right, color pictures available through your computer).

Our objective is to have a non-release version of **CCM** available for testing with a limited number of growers and consultants in the 1995 growing season. If we receive funding for the second year, we hope to have the final version available for distribution for 1996. (Of course, nothing is "final" in the world of computer software. As we develop new information and get new collaborators, we will continue to upgrade and improve **CCM**.) **CCM** is being developed to run in MS-DOS under Microsoft Windows (on an IBM or clone type of computer); this is the system supported by UW Extension and the UW Integrated Pest Management Program. The program is being designed to run on a 486 (or higher) computer with at least 8 MB RAM and a moderate-sized hard disk. Such computers are readily available for under $2000, and, of course, have multitudes of business and personal applications beyond **CCM**. We will continue to keep you informed of our progress in the development of this new tool for the cranberry industry.

Dan Mahr, UW - Madison, Department of Entomology

The future belongs to those who prepare for it.

Emerson

WHAT'S AHEAD?

By late July we should start to see the Cranberry Flea Beetle adults. Remember that this pest does its damage in the larval stage, but is easily controlled as an adult. Keep a close eye out for it.

The Girdler flight has been alarming in many areas. The larvae are in the soil and you will see stress towards the end of our scouting season. By harvest, if things have not been taken care of it will stick out like a sore thumb with reddening, dying vines. Hopefully growers won't allow girdler to get that far.

We are moving into that time of year when we historically see sun scald. We have observed areas by the pipelines in beds and in less dense vined-in locations to be the most vulnerable. Puddled water acts as a mirror, thus watch your drainage so you can get rid of excess water, fast.

Jayne Sojka, Lady Bug IPM

COOLING

A common fruit production technique is to cool the fruit and plants with water. Sprinkling with water for cooling is frequently used in tree fruit production, particularly in arid and hot regions. The principles are similar as for frost protection. As water changes from a liquid to a gas heat is consumed. As this heat is transferred to the water the plants are cooled. The home I grew up in was cooled with an evaporative cooler. Water is dripped through pads outside of a fan. As the fan draws air through the pads into the house it is cooled as the water evaporates.

The rate of cooling is a function of the water content of the air in relation to its ability to hold water. Warm air can hold more water than cool air. During a given day the water content of the air is relatively stable (unless a front moves through the area), but the relative humidity will fall as the air warms. Table 1 shows the change in relative humidity at a constant air water

content of 50 grains per pound of air as the temperature increases.

Table 1. Change in relative humidity with constant moisture content of 50 grains

Air temperature (F)	Relative Humidity (%)
55	78
60	66
65	55
70	47
75	38
80	32
85	28
90	25

If you want to sprinkle to cool vines and avoid sun scald, wait until the relative humidity begins to drop. The difference in water content between the air and the vines actually drives the cooling process. As the air temperature increases during the day the cooling capacity also increases. Most people I talk to suggest running the sprinklers for a couple of hours once you start.

One story related to sprinkling for evaporative cooling that I keep running into, not only from cranberry growers, but from other crops as well is that water droplets on the leaves act like little magnifying glasses that will concentrate sunlight on a small area and burn the leaves. This has no basis in fact. I know of no research data that supports this view. Water droplets are not shaped like little magnifying glasses. Don't be afraid to use evaporative cooling for fear of "burning" your vines.

Teryl Roper, UW-Madison, Extension Horticulturist

PESTICIDES & LAUNDRY

At the end of each work day, launder all clothes that were worn when handling pesticides. If fabric clothing is saturated with pesticide concentrate, **discard it**. Clothing contaminated with pesticide concentrate still contained a high amount of pesticide even after 10 washings. Handle heavily contaminated clothing with appropriate resistant gloves. Launder other clothing worn while handling pesticides using the following guidelines.

- While still outdoors remove pesticide granules from cuffs and pockets.
- Pre-rinse clothing by spraying with a hose, soaking in a bucket or tub or use the rinse cycle of the washer.
- Wash clothing separate from family clothing. Pesticide residues can be transferred from contaminated clothing to other clothing. Don't try to wash too large of a load.
- Wash in hot water to more thoroughly remove pesticides. Use the highest water setting and a heavy duty detergent. Neither bleach nor ammonia help remove pesticides.
- Wash a second time if needed.
- Before doing other family wash run through another cycle (with detergent) to rinse out the washing machine.
- Line dry so that pesticide residues do not build up in the dryer.

Wash the respirator facepiece in detergent and water. Rinse and dry it thoroughly. Don't use solvents such as alcohol, they can damage the rubber and plastic. Store the respirator in a large Ziplock bag. Also wash resistant gloves and aprons with water and detergent, rinse, and line dry. Test the gloves for leaks by filling them with water and squeezing.

Improperly maintained protective equipment and clothing can re-contaminate you with every wearing or use. Protect yourself and your family by handling pesticide contaminated clothing properly.

Extracted from: Pest Management Principles for the commercial applicator--Fruit Crops, 1994.

CALENDAR

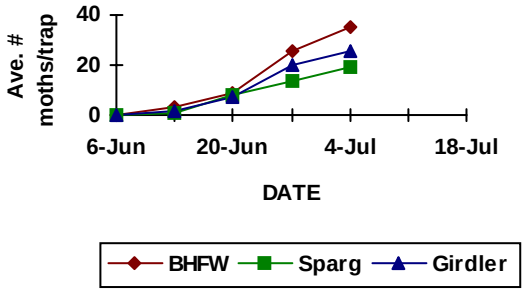
The 1994 Cranberry Field Day will be held Wednesday August 10 at G. Brockman's Owl Creek Marsh and Dexter Lake Park near Dexterville. This field day is sponsored by the Wisconsin State Cranberry Growers Association and the University of Wisconsin-Extension.

1994 Pheromone trap counts

Cranmoor area includes:	Adams, Portage and Wood counties
Warrens area includes:	Jackson, Juneau and Monroe counties
Northeast area includes:	Forest, Lincoln, Oneida, Price, and Vilas counties
Northwest area includes:	Barron, Burnett, Douglas, Rusk, Sawyer, and Washburn counties

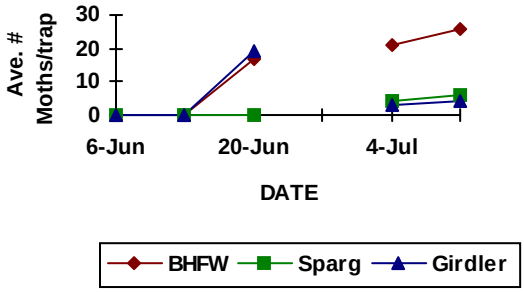
Please note that different regions may have different scales on the left axis. Doing this allows greater accuracy in determining actual values within a region. However, comparisons between regions are more difficult. Please use caution in making comparisons of these averages to trap counts on your marsh.

Northwest Area



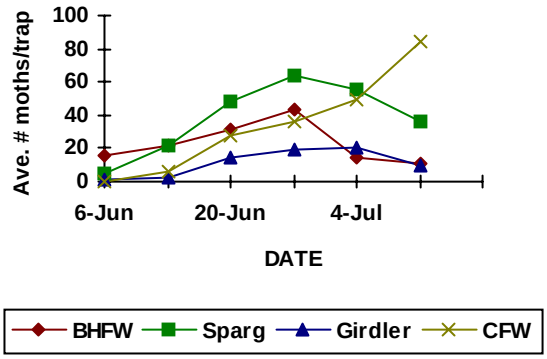
Means from 8 growers

Northeast Area



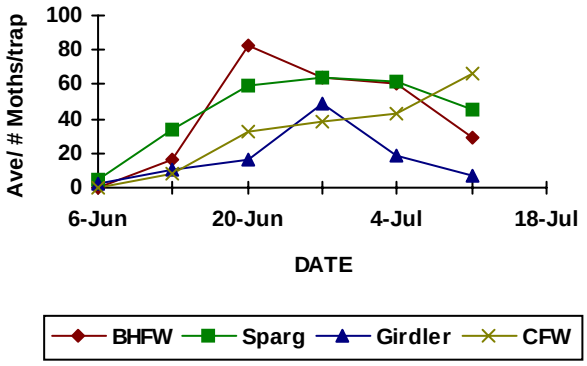
Means from 2 growers

Warrens Area



Means from 39 growers

Cranmoor Area



Means from 29 growers

ROUNDUP REMINDERS

Now that flowering is completed and fruit are setting, beds can be wiped with Roundup to control tall weeds. Be sure to read the Roundup label before making an application. A few points warrant reminders.

- Coverage is the most important variable. You must have good coverage of the weed's leaf surface in order to get enough material throughout the plant to kill it completely. Dyes added to the wiping solution help you tell where you have wiped.
- Increasing concentrations does not make Roundup more effective. Too high of concentrations may be detrimental as they can kill the contacted tissue before enough is translocated to kill the roots.
- Adding ammonium sulfate per the label specifications help entry of the active ingredient and improves control. (Jayne Sojka reminded me of this!)
- Roundup requires a 6 hour rainfree period following application to get into the plant. Don't apply if rain is imminent.
- Remember the 30 day pre-harvest interval.
- Keep the wiper surface clean for best results. If dirt, weeds or other debris covers the wiper, too little solution will get onto weed leaves.

Teryl Roper, UW-Madison, Dept. of Horticulture

We have too many people who live without working, and we have altogether too many who work without living.

Charles R. Brown

If you were graduated yesterday, and have learned nothing today, you will be uneducated tomorrow.

Author Unknown

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