MAGGOT MANIA!

An OSU Extension Newsletter about Cabbage Maggot Management Spring 2003

"MagNet" Unites Growers and Researchers

At the request of Willamette Valley Fresh Market growers, Oregon State University launched a program in Fall 2000 to study the cabbage maggot (CM).

The project, called "MagNet", unites growers with researchers to discover new maggot management tools.

We are currently working on the following strategies:

- Field monitoring
- Flight prediction
- Alternative chemistries and application techniques
- Beneficial insect habitat enhancement
- Spatial crop rotation
- Fall cultivation techniques

Amy Dreves demonstrates how to monitor for spring flight at the October, 2002 field day.

In the past, we have worked with the root crops, but will extend our knowledge to aboveground brassicas (e.g. cauliflower, cabbage, broccoli) in 2003.

This newsletter will bring you information about the cabbage maggot, including the latest MagNet findings. Eventually we will post the newsletter on the web.

It also provides a channel for you to communicate with us. We want to hear from you!

Email us with your questions, your stories, or to introduce yourself.

Amy Dreves
(541) 737-5576
drevesa@science.oregonstate.edu

Shannon Heuberger
(541) 737-9494
schowals@science.oregonstate.edu

Alex Stone
(541) 737-5461
stonea@science.oregonstate.edu

Meet the MagNet 2003 Research Team

Amy J. Dreves

Entomologist, Coordinator
OSU Horticulture Dept.

Shannon Heuberger

Assistant Coordinator
OSU Horticulture Dept.

Alex Stone

Vegetable Cropping Specialist
OSU Horticulture Dept.

Bob McReynolds

Vegetable Crops Extension Agent
OSU North Willamette Research and Extension Center (NWREC)

Chris Cornwell

Faculty Research Assistant
OSU NWREC

Tim Righetti & Mike Halbleib

GIS/GPS Mapping Specialists
OSU Horticulture Dept.

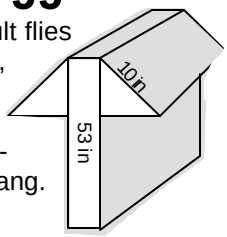
HOT OFF THE PRESS

Cabbage Maggot Research from Around the World

Fence with Overhang Reduces Maggot Damage

CANADA– Radish fields surrounded by 53 in. high exclusion fences with 10 in. long overhangs experienced significantly reduced levels of maggot damage. Researchers concluded that 80% of adult female flies are excluded from field entry by this barrier.

The walls and overhang of the structure consist of aluminum framed nylon window screens, supported by wooden fence posts painted black.



When low-flying adult flies encounter the fence, some will try to fly up and over it. These flies are intercepted by the overhang.

In this study, researchers compared unfenced plots, fenced plots without overhangs, and fenced plots with overhangs. All plots with overhangs experienced significantly less damage than other plots.

Researchers also compared overhang lengths of 5 in, 10 in, and 20 in. They concluded that a 10 in. long overhang is more effective than its 5 in. counterpart, and only slightly inferior to the more costly 20 in. version.

Bomford, M.K, Vernon, R.S, Päts, P, 2000. Importance of collection overhangs on the efficacy of exclusion fences for managing cabbage flies (Diptera: Anthomyiidae). Environ Entomol 29 (4), 795-799.

Foliar Glucosinolates

SCOTLAND- Glucosinolates are secondary plant products associated with brassicas. Glucosinolates on the leaf surface may explain why certain crucifers are more attractive to cabbage maggots (CM) than others.

In this laboratory experiment, leaf surface extracts were taken from 18 plant species and sprayed onto leaf-shaped pieces of waxed paper. After the wax leaves had been exposed to CM adult females, the number of eggs laid near each was leaf was recorded.

Researchers found that certain glucosinolates stimulate increased egg laying when they are found in high enough concentrations. However, glucosinolates are not the only compounds that stimulate egg-laying. Recently, three new compounds have been identified in brassicas as egg-laying stimulants.

This information could be used in varietal selection.

Griffiths, D.W, Deighton, N, Birch, A.N.E, Patrian, B, Baur, R, Städler, E, 2001. Identification of glucosinolates on the leaf surface of plants from the Cruciferae and other closely related species. Phytochem, 57 (5), 693-700.

Email Griffiths at: wgriff@scri.sari.ac.uk

Fiber Barriers Reduce Egg Laying in Broccoli

NEW YORK- Nonwoven ethylene vinyl acetate fibers (EVA), when placed at the base of broccoli seedlings reduced cabbage maggot egg-laying by 64-98%.

These fibers were produced in the field, at the time of application, using a melt-extrusion apparatus. This was connected to a hose and a spray nozzle that distributed fibers at the base of broccoli seedlings.

Fibers were distributed in 6-8 in. bands at the base of plants, in densities of up to 1/4 oz. per plant. Doubling fiber density from 1/8 oz. to 1/4 oz. reduced maggot infestation, but the difference was not statistically significant.

Because EVA is not degradable, this method is not yet economical for on-farm use. Cornell researchers are currently seeking a degradable fiber that can produce the same results.

Hoffmann, MP, Kuhar, TP, Baird, JM, Gardner, J, Schwartz, P, Shelton, AM, 2001. Nonwoven fiber barriers for control of cabbage maggot and onion maggot (Diptera : Anthomyiidae). J Econ Entomol 94 (6), 1485-1491.

Email Hoffmann at: mph3@cornell.edu

New Mustard Shows CM Resistance

NEW YORK- *Sinapsis Alba* L. 'Cornell Alt 543', a promising new mustard variety, was tested for its resistance to cabbage maggot egg laying and damage.

Compared to other cruciferous plants in the study, fewer eggs were laid on Cornell Alt 543. Also, Cornell Alt 543 had greater resistance to larval damage.

Plant characteristics that may help Cornell Alt 543 to defend itself include a network of protective plant hairs around its base, and possibly also an antibiotic effect.

In the future, Cornell Alt 543 may be bred into other cruciferous crops for cabbage maggot control.

Jyoti, JL, Shelton, AM, Earle, ED, 2001. Identifying sources and mechanisms of resistance in crucifers for control of cabbage maggot (Diptera : Anthomyiidae).

Curbing Spring Maggot Populations

If you grow cole crops in the Willamette Valley, chances are, you have fallen victim to the cabbage maggot (CM) at one time or another.

Winding, frass-filled tunnels pervading root crops, or the discoloration and wilting of stunted foliage in above-ground crops are signs that CM has landed.

During late winter months, cabbage maggots typically lie dormant in the soil as pupae. In the spring, overwintering pupae emerge as adult flies. For some crops, spring emergence leads to the most severe infestation of the year!

The question is: How can you make your field less attractive to this spring generation?

Here are some important preventative measures you can take:

1. Avoid planting within 1/4 mile of fall-planted brassica fields.
2. Apply treatment in the seed furrow at planting.
3. Promote healthy, even plant growth with proper fertilization.
4. Monitor for flight, eggs, and damage in your field, to help with informed decision-making.
5. If a field becomes infested, as detected by monitoring, avoid planting new fields nearby.
6. Disc under any residues of an infested field.

Fly Traps

You can use water pan traps to determine when spring flight has begun in your field. Here's how to make your own:

1. **Find a bright yellow, 1 gallon bucket.**
2. **Drill a few holes near the top to prevent overflow. Cover holes with screen using duct tape.**
3. **Fill bucket with water. Add a drop of soap and a little bleach.**
4. **Place bucket at canopy level near field borders where you suspect flies may enter.**
5. **Replace water weekly. Record weekly fly catch.**

If the number of trapped flies is more than 20 and has doubled since the previous week, the population could be increasing.

Not the best time to plant a new brassica field!

Join us for our April Monitoring Workshop

Don't miss out on our upcoming monitoring workshop! This event is an opportunity for you and/or a member of your farm staff to become trained in monitoring and record keeping.

Topics will include:

- Water pan traps
- Emergent cages
- Field egg counts
- Crop damage assessments
- Recording field data

Monitoring your fields is an important practice. It will help you to:

- Predict crop yields
- Time treatments more effectively
- Recognize problem fields before they affect other fields

Each participant will receive a "tool kit," which includes a magnifying lens, record sheets, and laminated information cards.

Please join us!

When:	TBA– April
Where:	North Willamette Research and Extension Center, Aurora (NWREC Station)
Cost:	TBA
Contact:	Shannon Heuberger (541)737-9494