

Amblyseius degenerans

Caster Bean Banker Plant



Predatory Bugs – Orius spp.

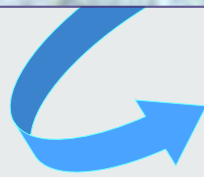


Adult *Orius insidiosus*



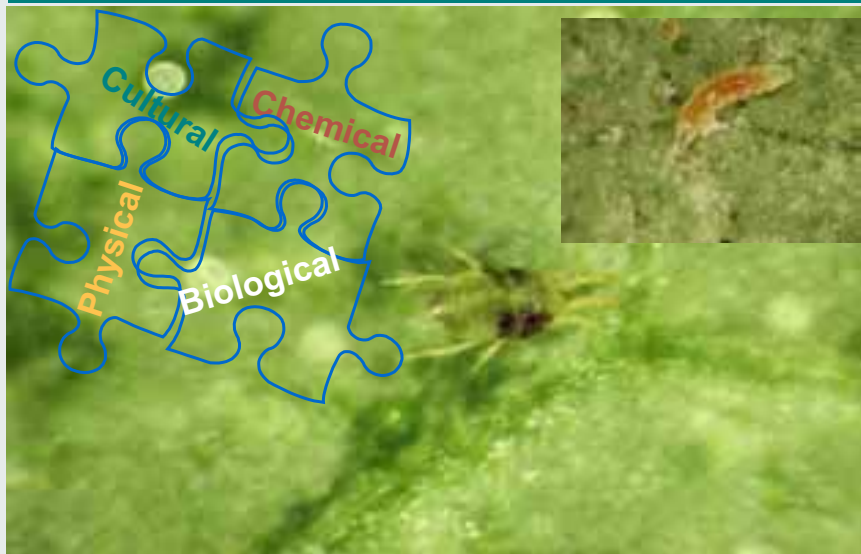
Nymphal stage

Entomopathogenic fungi – *Beauveria bassiana*

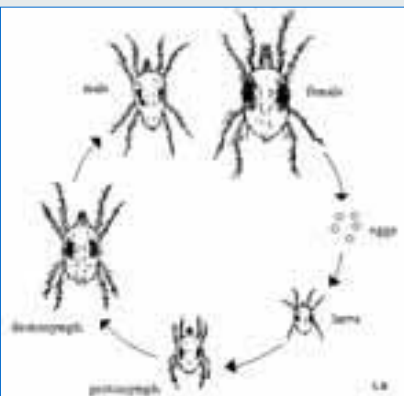


Beauveria-infected thrips

Spider Mite IPM



Life Cycle of Two Spotted Spider Mite



Spider Mite Damage to Crops



Cucumber leaf



Cucumber plants

Biological Control of TSSM Predatory Mites



Phytoseiulus persimilis



Amblyseius californicus

Predatory Midge - *Feltiella acarisuga*



Adult



Larva

Predatory Beetle - *Stethorus punctillum*



Adult



Immatures

Constraints to Greenhouse IPM in Canada

- Greenhouse pests that also transmit plant pathogens
- Extremes in climate among the different geographic greenhouse production regions
- IPM-incompatible chemicals
- Continual introduction of new greenhouse pests
- Deregulation of some chemicals has left growers without any or few products to control pest outbreaks

Reasons for Increased IPM in Canada

- Bumble bees for pollination
- Increased number of BCAs
- Improved quality control of BCAs
- Consumer demand for healthy products and health of the environment

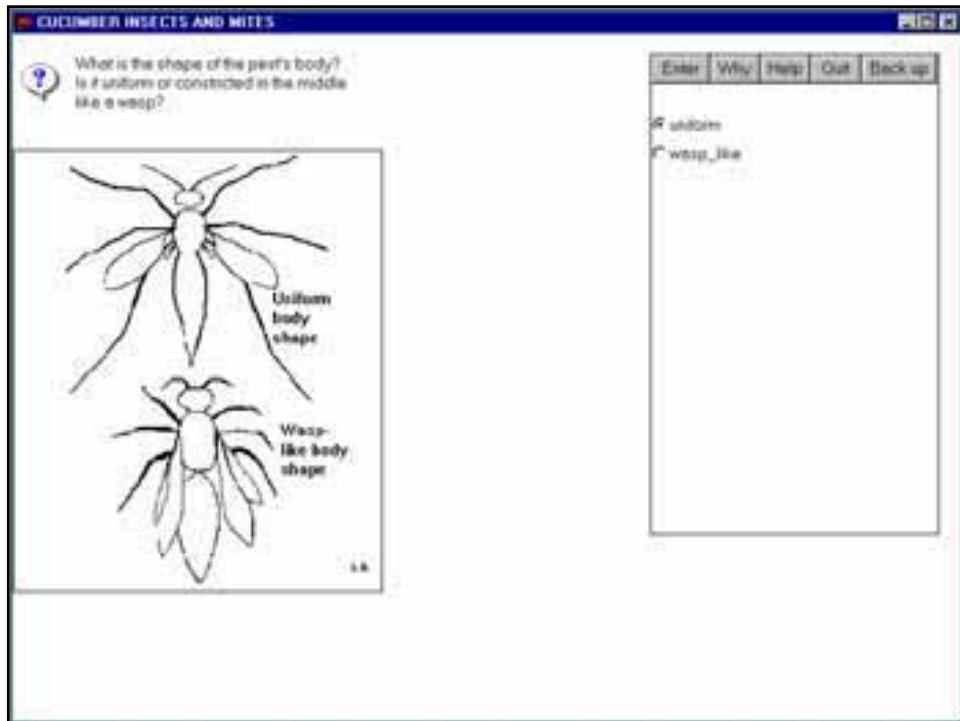
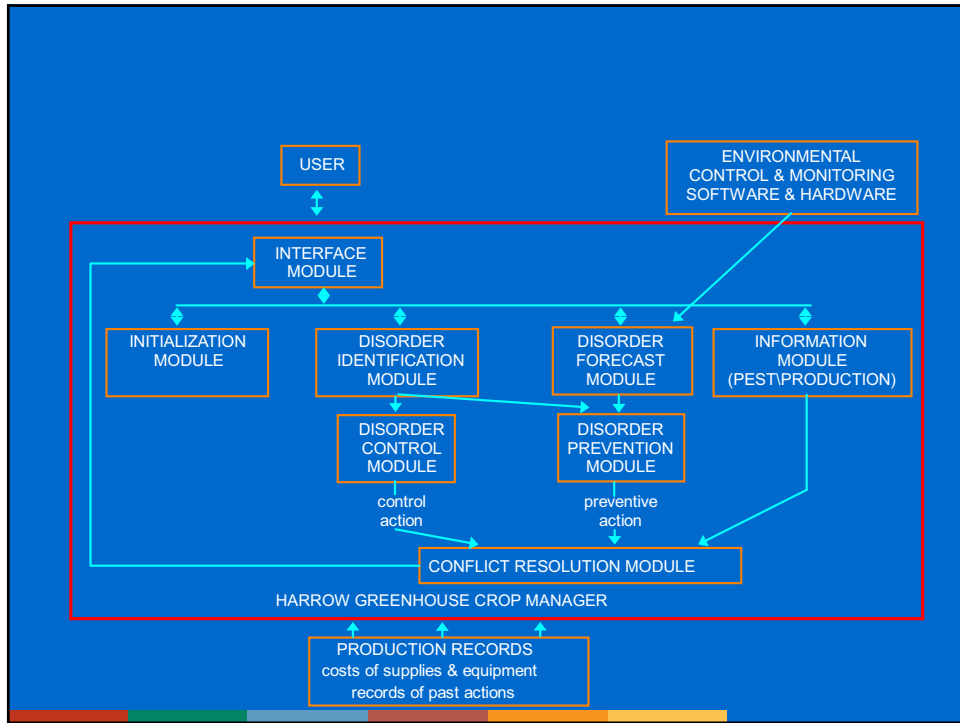


Reasons for Increased IPM Adoption in Canada

- Increase size of greenhouse operations
 - Better climate control
 - Usually 1 person assigned to IPM
 - Monitoring programs are routinely used
- Improved sanitation procedures and better clean-up in between crops
- Acceptance of alternative control/preventative strategy
 - Mating disruption
 - Screening vents
- Increases registration of IPM-friendly chemicals
- Improved technology transfer
 - More private consultants
 - Harrow Greenhouse Manager decision support system

INFORMATION OVERLOAD





The screenshot shows a web browser window with a page titled "parasitized" featuring a close-up image of a whitefly on a leaf. A pop-up window titled "Identifying Greenhouse Whitefly" is open, providing detailed information about the insect.

Identifying Greenhouse Whitefly

The adult stage is about 2.0 mm in length and a snowywhite color with four wings. The wings are held more or less horizontally over the body. All six adult whiteflies can be found on the undersides of the upper leaves, flying weakly when disturbed. The immature stages (1st to 5th nymphal instars) are translucent, flattened scales measuring 0.25 to 0.40 mm in length and are also found on the undersides of the leaves. The pupae are 0.75 mm in length, stout, white or whitish-yellow, with the red eyes of the adult showing through the top of the pupae. The sides of the pupae are vertically ridged from the leaf surface and covered with numerous glossy, spine-like hairs.

next topic: [Life History of Greenhouse Whitefly](#)

The screenshot displays the "CONTROL MODULE" software interface. It includes fields for "Vegetable" (Tomato) and "Compartment" (Tomato compartment). The "Disease Type" is set to "Insect/Mite" and the "Name" is "green_peach_aphid".

control actions

- Aphidius colemani
- Aphidius aphidimyza
- Dibrom
- Chrysoperla spp.
- Hippodamia convergens
- Nicotine
- Thiodan 4EC
- Thiodan 50% WP

Highlighted Control Type:

conflicts (for highlighted control)

The following chemicals are harmful to Aphidius colemani

Chemical: Ambush 10 EC
Scheduled: 06/05/09
Completed: / /
Days to wait from last application: 70

Conflict

Conflicts exist with:

Aphidius colemani

Are you sure you wish to add this control action to SCHEDULED TASK database?

notes (for highlighted control)

Control name: Aphidius colemani

HINTS: Introduce during the winter months or when the weekly until sufficient parasitized aphid "mummies" are available. Adult Aphidius are very efficient at finding aphids at low population densities. Also, adult Aphidius are very effective at high population densities. Adult Aphidius can be released year round, but the effectiveness of the parasite is decreased during the summer because of hyperparasitism (when one parasitic species parasitizes another parasitic species) on Aphidius. The parasites are shipped as mummies mixed with sawdust. The material should be sprinkled on the leaves and left there for a couple of days for the adult Aphidius to emerge. The optimum conditions for control are 18 to 25 C and 80% RH.

Harrow Greenhouse Man

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Life History of Western Flower Thrips

The life cycle consists of five stages: egg, larva, prepupa, pupa, and adult (Fig. 1). The adults are weak fliers and, under most conditions, tend to run and hop or have very short flights. However, the adults are strong enough fliers to disperse throughout the greenhouse. On the plant, the western flower thrips can be found throughout the plant but are most abundant in the middle section. The adults are readily seen in the flowers feeding on the petals and later on the developing fruit. Female adults can live up to 30 days and lay 2 to 15 eggs per day. Unmated females produce males, while mated adults produce a ratio of one third male to two thirds female. Therefore, when the population level is low, males are the predominant sex.

The eggs are inserted individually into the plant on leaves, stems and flowers. The eggs hatch in three to six days depending upon the temperature. There are two larval instars, both of which feed and mature on the leaves and flowers. The mature second instar eventually drops from the plant and develops into the prepupal and pupal stages. The pupal stage is a non-feeding stage during which the wings and other adult structures are formed. Development from egg to adult is 12 to 15 days at 25°C and approximately 18 days at 20°C. After the adults emerge, they fly to the plants to feed, mate and lay eggs.

[webpage: Damage Caused by Western Flower Thrips](#)

Harrow Greenhouse Crop Manager

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