Zebra caterpillars
Marian Paibomesai, Vegetable Crop Specialist

There have been a few reports of zebra caterpillars feeding on some garlic crops. This caterpillar is considered to be a minor nuisance pest on vegetable crops. Zebra caterpillars have a broad host range and will feed on several vegetable plants and weeds across southern Canada and northern US. Across this range there could be two generations of per year, with the first occurring in June-July and a second in August-October; however, little is known about the life cycle of this pest in Ontario.

The moth is a brownish, non-descript moth with a wingspan of ~2 cm. The female lays its eggs in clusters. The eggs hatch all at once and the larvae swarm all over the leaf surface (Figure 1).

Zebra caterpillar larvae are the destructive life stage. The larvae defoliate leaves through feeding. Small larvae make small holes and skeletonize foliage, while larger larvae will eat large holes in foliage (Figure 2). Mature larvae have distinct yellow, black and white markings (Figure 3). Yellow and white stripes separated by ‘zebra’ striping run along the side of the larva. The underside is orange. Young larvae tend to feed in groups. They are green or dark coloured and can be difficult to distinguish from other types of caterpillars.

Infestations are typically sporadic and random and usually do not warrant control measures. Remove infested plant material and destroy larvae.
COMING EVENTS

June 28, Lavender Variety Trial Twilight Tour. 7:00 to 9:00 pm Meet at Bonnieheath Lavender, 418 Concession 12, Waterford. Travel on to Apple Hill Lavender, 1795 Windham Road 11, Windham Centre Free to members of the Ontario Lavender Association; $10 for non-members. For more information visit www.ontariolavenderassociation.com

July 4 or 5, Southwest Diagnostic Days. Ridgetown. For more info visit: http://www.diagnosticdays.ca/

July 10, Ridgetown 2012 Open House. Ridgetown. Participants have a choice of an afternoon tour 1:30-4:30 pm, or an evening our 6:00-9:00 p.m. No cost, no pre-registration required. Watch for more details coming soon.

July 12-14, Canada’s Fruit & Veg Tech X-Change, St. Williams. For more info visit: http://www.fruitvegtechxchange.com/


July 26-27, IFTA Study Tour, Quebec. For more information or to register visit the website: www.ifruittree.org/

August 14-15, North American Strawberry Growers Association Summer Tour, Halifax, Nova Scotia. See more info on pg 7 or visit www.nasga.org

August 21, Grape Research Tour. More details to follow.
The Pest Management Regulatory Agency (PMRA) recently announced the approval of a minor use label expansion for Betamix B EC herbicide (desmedipham + phenmedipham) for control of weeds on newly planted, June-bearing strawberries in Canada. Betamix B EC herbicide was already labeled for use on sugarbeets and red beets in Canada and has a proven record of efficacy and safety.

This minor use project was sponsored by Agriculture and Agri-Food Canada, Pest Management Centre (AAFC-PMC) and was initiated in 2009 in response to minor use priorities identified by producers and extension personnel in Canada.

Weed management on strawberries has been a high priority item for a number of years and the registration of Betamix B herbicide will provide strawberry producers with an effective and useful weed management tool.

The following is provided as a general outline only. User should consult the complete label before using Betamix B herbicide.

Betamix B herbicide may be applied to June-bearing strawberry varieties in the year of planting as a post-transplanting application to control labeled weeds. Apply Betamix B at 1.15 to 1.75 L per ha as a broadcast spray in 100 – 200 L of water. The 1st application must be applied when the earliest weeds have reached cotyledon stage. Repeat applications at 5 – 7 day intervals following the 1st application or when another flush of weeds germinates. Apply a maximum of 3 applications per season and do not harvest any berries that might develop in the year of planting. Consult the full product label for precautions and detailed use directions.

Betamix B herbicide should be used in an integrated weed management program and in rotation with other management strategies. Follow all other precautions and directions for use on the Betamix B herbicide label.

We also wish to acknowledge the personnel of Bayer CropScience Inc. for their support of this registration and the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool.

For copies of the new minor use label contact Kristen Callow, OMAFRA, Ridgetown (519) 674-1335, Pam Fisher, OMAFRA, Simcoe (519) 426-2238 or Jim Chaput, OMAFRA, Guelph (519) 826-3539 or visit http://www.bayercropscience.ca

**More Hort Shorts on pgs 4, 5 & 7**
Beetle pests of strawberries
Pam Fisher, Berry Crop Specialist

Several unusual pest problems are showing up in strawberry fields. These are not common problems but are causing significant, although sporadic, damage this year.

**Strawberry rootworm:**
This is a small round beetle that feeds at night on strawberry foliage. The adults hide during the day and are very hard to find. They feed on strawberry foliage in spring and early summer. In mid summer, strawberry rootworm larvae feed on crowns and roots, which can reduce plant vigour, especially at renovation. Adults emerge again to feed on foliage in late summer. Because this pest is so small, it takes a lot to cause injury to strawberry plants. Leaf injury is generally considered more serious than root injury.

Usually the problem is only significant in no-spray or low spray fields, and even then, it is rarely a problem. However, this year, damage has been more evident than usual.

**Strawberry sap beetle:**
Not your ordinary beer bug, but in the same family, the strawberry sap beetle, and the dusky sap beetle are small brown or black beetles that drill holes into ripe, but not necessarily over-ripe strawberry fruit. The holes are small, round and deep. Occasionally small beetles can be found inside. A distinguishing characteristic of sap beetles is the clubbed antenna. The sap beetles found in strawberries also have shortened wing covers, or elytra, so the last abdominal segments are visible. Beetles overwinter at the edge of woodlots and possibly under woody crops such as brambles and blueberries but they do not appear to overwinter in strawberry fields. As strawberries ripen, beetles move into the field and begin feeding and laying eggs. This pest is a problem in New York, Ohio and sometimes Michigan, but is only occasionally seen in Ontario. Control of this pest is very difficult and insecticides have little effect. Tight picking schedules are important.

Perhaps the mild winter of 2011-2012 contributed to the abundance of both these pests in 2012.

**HORT SHORTS**

Berries: Strawberry harvest is bittersweet this year. Berries are small and heat this week will bring harvest to a quick end in southern Ontario. Some unusual pests, such as strawberry sap beetle, and strawberry rootworm, are showing up. Jewel plantings are dying back from rhizoctonia and black root rot. Raspberry harvest (cv Prelude) has begun in early areas and good yields are anticipated. Sub-lethal winter injury could still show up if canes are stressed by dry soil conditions. Blueberry growers are installing bird netting and anticipating an early crop. Cranberry fruitworm larvae are causing damage where post bloom spray timing was off. Flagging and dieback of shoots is starting to show up.
You suspect herbicide drift – now what?
Kristen Callow, OMAFRA Weed Management Program Lead - Horticulture
Leslie Huffman, OMAFRA Apple Specialist

Crop injury caused by herbicide drift is guaranteed to cause misery and confrontation, not to mention insurance claims and legal charges. *No one wins when herbicides drift* – the applicator loses two ways: his herbicide misses the target, giving poor weed control, plus he is liable for damage; the “receiving” grower loses yield, crop health, perhaps timely markets plus his time. Sometimes our environment loses, and in general, agriculture loses in the public eye.

There are a number of steps to follow when you suspect herbicide drift:

1. **Diagnose the problem:**
   - Is it really drift? Eliminate other possible causes, such as: disease, insect, nutrient deficiency, herbicide carryover, environmental stress - may be similar to herbicide drift, etcetera.
   - Are there patterns in the field? Is the damage worse next to the spray source, with less damage occurring across the field? Is the damage patchy? If it is, you need to check your soil pH. If your pH is considered high or low, test for herbicide carryover.

2. **Contact the appropriate people:**
   - Talk to your neighbour or sprayer operator. Ask what was sprayed, when it was applied and who did the application.
   - Contact your regional Ministry of the Environment office (1-800-265-7672 Southwestern Region) – MOE officers can do a site visit, take samples of tissue and soil, and have them analyzed for the suspect herbicides. Where appropriate, the offending applicator may face charges under the Pesticide Act.
   - Contact your insurance adjustor, and advise the applicator to contact theirs.

3. **Document all details of the problem:**
   - Collect spray records (yours - to prove it wasn’t your sprays) and the offending applicators’.
   - Collect weather records (temperatures, wind speed, wind direction, rainfall - for the date of application).
   - Take photos (many). Record date and location on each photo. Repeat photos several times through the season.
   - Document yield loss from the damaged area and an undamaged area. Choose a similar planting (same age, cultivar, rootstock, etcetera). For perennial crops (e.g. vineyards, orchards, asparagus, berries) document the effects for several years after the damage occurred.

Every herbicide applicator needs to take all possible steps to avoid herbicide drift. So what should an applicator do?

- **Work with the weather.** Avoid spraying when the weather is against you, e.g. when winds are above 11 km/hr or dead calm, when temperatures are above 30°C, and/or when relative humidity (RH) is above 80%.
- **Identify vulnerable crops near your fields.** Choose a spray day when winds are blowing away from these sites.
- **Make your spray less prone to drift.** Choose herbicides with a low risk of volatility. Avoid products like 2,4-D or dicamba near susceptible crops or greenhouses. Choose higher water volumes and lower pressures for larger droplets. Use the newest anti-drift nozzles. There are many air-injection (AI) nozzles that will greatly reduce risk.
- **Work with your neighbours.** Let them know your intentions. Maybe you can both make some buffer areas between vulnerable crops. Greenhouse growers need to be notified to close vents during early morning spray times to avoid any possibility of drift.

Visit: [www.ontario.ca/spraydrift](http://www.ontario.ca/spraydrift) for more information

**HORT SHORTS**

*Nursery and Ornamentals:* European chafer and Japanese beetle adults are active. European chafer adults form mating swarms at dusk around deciduous trees. A preventative application of Intercept (imidacloprid) is registered for white grubs in nursery production. In the field, the application period is June to July (to coincide with egg-laying). Japanese beetle adults will feed on flowers and foliage of *Prunus*, *Rosa*, *Syringa*, *Tilia*, *Ulmus* etc. To help qualify for the Japanese beetle certification program, an application of Intercept on container or field stock should be some time between June to July. The cut-off period for Intercept applications to comply with the JB Certification program this year may be as early as July 31st. Nematode applications for white grubs (e.g. European chafer) are not effective at this time. Try timing nematode applications for late August/early September to catch early instar larvae.
Engage Agro Corporation and the Pest Management Regulatory Agency (PMRA) recently announced the registration of Phostrol® (sodium, potassium and ammonium phosphites) Fungicide for several crops in Canada. Phostrol® belongs to the phosphonate group of fungicides and this registration marks an important milestone in addressing the pest control product technology gap between the U.S. and Canada. This group of fungicides including Phostrol® and the diseases they control have been identified for many years as important disease management and resistance management tools needed by Canadian producers.

Phostrol® Fungicide is registered for control or suppression of pink rot and late blight of potato, downy mildew of grape, leafy greens, cucurbits and head and stem Brassicas, leather rot of strawberry, Phytophthora root rot of raspberry and ornamentals, late blight of tomato and Pythium blight of turf. The following table provides a summary of the crop registrations on the new Canadian Phostrol® Fungicide label. Consult the full product label for detailed instructions, precautions and restrictions.

<table>
<thead>
<tr>
<th>Crop or Crop Group</th>
<th>Rate Product per hectare (L / ha)</th>
<th>Remarks</th>
<th>Pre-harvest interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potatoes</td>
<td>5.8 – 11.6 (pink rot); 2.9 – 11.6 (late blight)</td>
<td>Pink rot suppression, late blight control: Do not make more than 7 applications per season. See label for more details.</td>
<td>0 days</td>
</tr>
<tr>
<td>Potatoes (post-harvest)</td>
<td>0.42 L in 2 L water to 1 tonne tubers</td>
<td>Pink rot and late blight control. See label for more details.</td>
<td>n/a</td>
</tr>
<tr>
<td>Grapes</td>
<td>2.9 – 5.8</td>
<td>Preventative control of downy mildew: Do not make more than 4 applications per season. See label for more details.</td>
<td>0 days</td>
</tr>
<tr>
<td>Leafy greens (lettuce, cress, endive, radicchio)</td>
<td>2.9 – 5.8</td>
<td>Preventative control of downy mildew: Do not make more than 7 applications per season. See label for more details.</td>
<td>0 days</td>
</tr>
<tr>
<td>Head &amp; stem Brassicas, crop subgroup 5A (broccoli, Chinese broccoli, Brussels sprouts, cabbage, nappa cabbage, Chinese mustard cabbage, cauliflower, kohlrabi)</td>
<td>2.9 – 5.8</td>
<td>Preventative suppression of downy mildew: Do not make more than 4 applications per season. See label for more details.</td>
<td>0 days</td>
</tr>
<tr>
<td>Strawberries</td>
<td>4.1</td>
<td>Preventative control of leather rot: Do not make more than 4 applications per season. See label for more details.</td>
<td>3 days</td>
</tr>
<tr>
<td>Raspberries</td>
<td>5.2</td>
<td>Preventative suppression of Phytophthora root rot: Do not make more than 4 applications per season. See label for more details.</td>
<td>0 days</td>
</tr>
<tr>
<td>Cucurbit vegetables, crop group 9 (cucumbers, gherkins, melons, gourds, pumpkin, squash, etc.)</td>
<td>2.9 – 5.8</td>
<td>Preventative suppression of downy mildew. Do not make more than 7 applications per season. See label for more details.</td>
<td>0 days</td>
</tr>
<tr>
<td>Tomato crop subgroup 8-09A (tomatoes, huckleberries, tomatillo, goji berry, groundcherry, etc.)</td>
<td>2.9 – 5.8</td>
<td>Preventative suppression of late blight: Do not make more than 4 applications per season. See label for more details.</td>
<td>0 days</td>
</tr>
<tr>
<td>Greenhouse, outdoor bedding plants, potted plants and cut flowers</td>
<td>2.9 – 5.8 L per 1000 L water (foliar) 1.2 – 5.6 L per 1000 L water (drench)</td>
<td>Preventative suppression of Phytophthora root rot: Do not make more than once every 30 days. See label for more details.</td>
<td>n/a</td>
</tr>
<tr>
<td>Turf</td>
<td>130 – 260 mL per 100m²</td>
<td>Preventative suppression of Pythium blight: Do not make more than 4 applications per season. See label for more details.</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Follow all other precautions and directions for use on the Phostrol® Fungicide label carefully. Consult individual crop and disease control recommendations on the Phostrol® Fungicide label for additional use restrictions.

Phostrol® Fungicide should be used in an Integrated Pest Management program and in rotation with other management strategies to adequately manage resistance. Consult provincial guidelines and local extension specialists for monitoring protocols and disease management recommendations.

We wish to thank the personnel of Engage Agro Corporation for their support of this registration and the personnel of the Pest Management Regulatory Agency for evaluating and approving this important pest management tool. For copies of the new Phostrol® Fungicide label contact Jim Chaput, OMAFRA, Guelph (519) 826-3539 visit the Engage Agro website at www.engageagro.com.
North American Strawberry Growers Association  
2012 Summer Tour - Halifax, Nova Scotia

NASGA has a great summer tour lined up for August 14-15, 2012.  
See registration details online at www.nasga.org, or contact NASGA at 613-258-4587.

**Host Hotel:** Quality Inn Halifax Airport Hotel - 1-800-424-6423 or 902-873-3000

**Registration and Reception:** August 13, 2012 - 7:00 pm to 9:00 pm

**DAY 1 – Tuesday August 14th, 2012**
- **Burgess Baskets** – Manufacturers of wooden boxes and baskets - tour of factory
- **Webster Farms** - Matted row strawberry production, biennial raspberry production, raspberry variety trial, new Kentville selections, raspberry trellising
- **Vital Berry** - Strawberry plasticulture, day-neutrals and June-bearers, compost and fertigation research trial, tomatoes, beans.
- **G.W. Allen Nursery** - Nursery packing house and northern variety screenhouse, “Southern” certified strawberry nursery field, Raspberry certified nursery field, “Northern” certified strawberry nursery field
- **C.O. Keddy Nursery** - Supper - Northern and Southern Nursery Production

Return to Quality Inn at 8:30 pm

**DAY 2 – Wednesday August 15th, 2012**
- **Elmstale Sobey’s** – Unique Strawberry marketing at Nova Scotia’s largest grocery chain store.
- **Millen Farms** - Strawberry plasticulture (day-neutrals, June-bearers, and 60-day crop). Millen Farms fruits and picks 130 acres of fresh strawberries, grows 25 acres of nursery plants and fresh packs more than 200 acres of wild blueberries. See matted row strawberry production system, raspberries, fresh pack wild blueberries, fresh QC traceability system
- **Masstown Market** – Sales of fresh local produce along with a made from scratch bakery. Other features include fresh prepared local seafood. We will enjoy lunch at this local market.
- **Rines Creek Vineyard** – tour of Vineyard featuring 20 acres of vines which include including some Quebec varieties and French hybrids. Noble grapes and some recently planted vinifera

Return to Quality Inn at 4:30 pm

**Spotted Wing Drosophila Update - June 22**
We are working with a network of scouts, consultants and researchers to monitor for SWD at over 100 sites in fruit and tomato crops across Ontario. So far, SWD has not been detected in Ontario in 2012. However, new reports of activity are coming from the south-eastern states, Michigan and British Columbia. Although SWD showed up too late in Ontario to cause damage in 2011, it will probably be earlier in 2012. At present, strawberries, raspberries, cherries, and early blueberries are susceptible to attack. If SWD is detected in your area, be ready to apply controls. Watch for soft or "leaky" fruit that breaks down prematurely. Fortunately, emergency use registrations for Malathion, Ripcord, Delegate and Entrust have been approved for 2012. For updates, visit our SWD webpage ontario.ca/spottedwing.

**Vegetables:** Potatoes are still ahead about 7 days but are under stress due to the hot weather. Growers are irrigating, especially the early planted fields that are at the bulking stage. Cucurbit Downy Mildew was confirmed on June 14th, 2012 in a cucumber field in Wayne County, Ohio. This significantly increases the risk of infections occurring here in Ontario. All cucumber growers should begin a preventative fungicide program immediately. Thresholds for second generation emergence of onion maggot flies and cabbage maggot flies should be reached in 5-7 days in the Windsor area. In all areas, if resident populations are present, carrot weevil have likely completed 90% oviposition. The threshold for emergence of local adult leafhoppers has been reached in Bradford/Holland Marsh, London, Thedford, and Delhi and is expected to be reached in Wellington over the next 2-3 days. What kind of aster leafhopper numbers you are seeing in the field, especially if you are using sweep nets for counts? At the end of May, Michigan was seeing infectivity rates between 11-15%; however, this week’s Vegetable Report from Michigan shows that the infectivity rates are lower. Leafhoppers can migrate from the south or overwinter here. They carry the aster yellows phytoplasma, which affects celery, carrots and lettuce. The heat wave Ontario is going through is stressing the potato crop. Growers are irrigating, specially those early planted fields that are at the bulking stage. Neonicotinoids applied at planting are keeping leafhoppers under control. Fields planted by the middle of April should be monitored closely for potato leafhopper infestation because neonicotinoids usually start to break down 60 days after applications.