HORT MATTERS

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Weevils added to Actara 25WG insecticide label via Minor Use Program for Crop Subgroup 13B, Bushberries

J. Chaput, OMAFRA, Minor Use Coordinator, Guelph

The Pest Management Regulatory Agency (PMRA) recently announced the approval of an URMULE registration for crop subgroup 13B, bushberries (blueberries, currants, gooseberries, saskatoons, elderberries, etc.) in Canada for **ACTARA 25WG** (thiamethoxam) insecticide for control of weevils (black vine weevil, *Otiorynchus sulcatus* and obscure root weevil, *Sciopithes obscurus*). The active ingredient thiamethoxam was already labeled on pome fruit and potatoes and as a seed treatment on several cereal crops and legume crops in Canada.

This minor use project was initiated in late 2006 by the Agriculture & Agri-Food Canada, Pest Management Centre (AAFC-PMC) as a result of minor use priorities established by growers and extension personnel in Canada. The minor use registration of Actara insecticide is a significant step towards developing a more robust and sustainable pest management toolkit for these pests.

The following is provided as a general outline only. Users should consult the complete label before using Actara 25WG insecticide.

Actara 25WG insecticide can be used for control of weevils on crop subgroup 13B, bushberries at a rate of 210 – 280 g product per hectare in at least 100 L water per hectare. Timing of applications should be based on the presence of vulnerable pest developmental stages and significant populations as determined by field monitoring. The application interval is 7 days depending again on the presence of significant populations as determined by local monitoring.

Do not make more than 2 applications per season. Do not apply within 3 days of harvest.

Follow all other directions for use on the Actara 25WG insecticide label carefully.

Actara 25WG insecticide should be used in an integrated pest management program and in rotation with other management strategies to adequately manage resistance.

The minor use project for bushberries was sponsored by AAFC-PMC as a result of minor use priorities established by producers in Canada. We also wish to thank the personnel of **Syngenta Crop Protection Canada** 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 Jim Chaput, OMAFRA, Guelph (519) 826-3539, Pam Fisher, OMAFRA berry crops specialist at Simcoe (519) 426-2238 or visit the Syngenta Canada website at www.syngenta.ca/en/

Time to target perennial weeds

Leslie Huffman, Weed Management Specialist (Horticultural Crops)

June is the ideal time to scout fields for perennial weeds, and spot treat them to prevent major problems.

Timing: Many broadleaf perennial weeds are approaching the **sensitive stage** for systemic herbicides (eg. glyphosate). For best results, apply at these stages:

Canada Thistle @ early flower bud
Milkweed @ flower bud
Bindweed @ full flower

Quackgrass needs to be actively growing with at least 3 to 4 new leaves to absorb the herbicide. If it is larger than this, but still growing, it's still susceptible.

Rates: Note that there are 4 concentrations of glyphosate on the market this year, which affects the product rate for each type of weed. So Read the Label! For example, there are 3 rate ranges for glyphosate products with an active ingredient concentration of 360 g/L:

Annual weeds: 0.75 to 3.5 L/ha
Canada thistle and quackgrass: 2.5 to 7.0 L/ha
Perennial broadleaf weeds: 7 to 12 L/ha

Use the high end of the rate range where weeds are larger and growth is dense.

Caution: Avoid contacting desired plants, including low branches and root suckers. Glyphosate will circulate in trees for several years if absorbed. Research suggests that low levels of glyphosate in a plant makes it susceptible to disease. Wick wipers will minimize contact with the crop, and shields can protect low hanging branches.

Prevention: Essential to success in controlling perennial weeds, especially in perennial crops:

- Scout for weeds along the edges of fields, in fencerows and ditch banks.
- Prevent seeds by mowing or using a systemic herbicide before flowering.
- Clean up fields for new plantings by spot treating perennial weed patches.

Control of perennial weeds is generally a 2 or 3 year proposition. Investing some time each year will keep these pests to a manageable level in your fields.

Figure 1: Canada Thistle at early flower bud

Figure 2: Milkweed at flower bud

Figure 3: Field Bindweed in full flower

Figure 4: Quackgrass stopped growing due to dry conditions

Figure 5: Vetch at early flowering is the optimal stage for Lontrel

Allegro 500F Fungicide label expanded via Minor Use Programto include clubroot control on Brassicas and disease suppression on Crop Subgroup 13B, Bushberries

J. Chaput, OMAFRA, Minor Use Coordinator, Guelph

The Pest Management Regulatory Agency (PMRA) recently announced the approval of URMULE registrations for **ALLEGRO 500F Fungicide** for control of clubroot on crop group 5, Brassicas and for suppression of mummyberry, phomopsis fruit rot and fruit anthracnose on crop subgroup 13B, bushberries (blueberries, currants, gooseberries, saskatoons, elderberries, etc.) in Canada. Allegro was already labeled for late blight on potatoes in Canada. These are the 1st minor use label expansion registrations for this product in Canada and have been in the system since 2003 as joint projects between Agriculture & Agri-Food Canada, Pest Management Centre (AAFC-PMC) and the US IR-4 program.

These minor use projects were initiated in 2003 by AAFC-PMC as a result of minor use priorities established by growers and extension personnel in Canada and the USA. The minor use label expansions for Allegro 500 F Fungicide are a significant step towards developing a more robust and sustainable pest management toolkit for these diseases in both countries.

The following is provided as a general outline only. Users should consult the complete label before using Allegro 500F Fungicide.

For clubroot control on Brassicas, crop group 5 (cabbage, cauliflower, broccoli, bok choi, Chinese broccoli, kale, kohlrabi, mustard greens, Brussels sprouts, Nappa cabbage):

Allegro 500F Fungicide can be used for control of clubroot on Brassicas either as a pre-transplant treatment or as a transplant treatment. For pre-transplant apply Allegro at a rate of 2.9 L product in 500 L water per hectare in a minimum band of 25 cm along the planting row and incorporate to a depth of 15 to 20 cm with a precision incorporator. Transplant the seedlings into the treated band.

As a transplant treatment mix 50 mL of Allegro 500F with water to make a 100 L solution. Apply 100 mL of solution per plant immediately after transplanting.

Do not make more than 1 application per season. Do not apply within 65 days of harvest for the head and stem Brassicas, subgroup 5A (broccoli, Brussels sprouts, cabbage, cauliflower, kohlrabi) and do not apply within 30 days of harvest for the leafy Brassicas, subgroup 5B (bok choi, collards, kale, mustard greens)

Follow all other directions for use on the Allegro 500F Fungicide label carefully.

For suppression of mummyberry, phomopsis fruit rots and fruit anthracnose on bushberries, crop subgroup 13B (blueberries, currants, elderberries, gooseberries):

Allegro 500F Fungicide can be used for suppression of mummyberry, phomopsis fruit rots and fruit anthracnose on bushberries at a rate of 2.24 L product per hectare in 300 to 1000 L water per hectare as a foliar spray. A maximum of four (4) applications per season can be made at an interval of 7 to 10 days. Begin applications at bud break and repeat until petal fall stage. Do not apply within 30 days of harvest for bushberries.

Allegro 500F Fungicide should be used in an integrated pest management program and in rotation with other management strategies to adequately manage resistance.

Follow all other directions for use on the Allegro 500F Fungicide label carefully.

The minor use projects for Brassicas and bushberries were sponsored by AAFC-PMC and trials were conducted jointly with the US IR-4 program as a result of minor use priorities established by producers in Canada and the USA. We also wish to thank the personnel of **ISK Biosciences Corporation** and Syngenta Crop Protection Canada 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 labels contact Jim Chaput, OMAFRA, Guelph (519) 826-3539, Pam Fisher, OMAFRA berry crops specialist at Simcoe (519) 426-2238, Kristy Grigg, OMAFRA acting vegetable specialist at Guelph (519) 826-4963 or visit the Syngenta Canada website at www.syngenta.ca/en/

Angular Leaf Spot in Strawberries

Pam Fisher, Berry Crop Specialist

Conditions have been good for the development of bacterial angular leaf spot in strawberries, caused by Xanthomonas fragariea. Conditions which favour this disease include cool temperatures, irrigation for frost protection, and splashing rain. Sound familiar?

Symptoms of angular leaf spot develop on the leaves and the fruit calyx. Tiny angular spots are first evident on the lower leaf surface. The spots look wet when viewed from above but are translucent when held up to the light. Bacteria ooze out of these spots in humid weather. When the ooze dries up, it leaves white flaky residue. Infected sepals turn black and make the fruit unmarketable. Infected leaves turn yellow with green or brown blotches. Although rare, this disease can be systemic on the plant, causing plant collapse. The most serious damage is when calyces are infected. Blackened calyces caused by angular leaf spot make the fruit less attractive and sometimes unmarketable.

Because it is a bacterial disease, angular leaf spot is not affected by most fungicides. The disease will not spread much now in fruiting fields. In new plantings, use the following management practices to reduce the risk for next year:

- Avoid excessive nitrogen because young leaf tissue and leaves on very vigorous plants are more susceptible.
- Clean up crop debris, especially on plastic-mulched beds.
- Avoid work in fields when they are wet.
- Avoid excessive irrigation for frost protection.

Cavendish, Annapolis, Kent seems especially susceptible to this disease, but it infects most varieties.

Fig 1: Angular leaf spot symptoms on lower leaves, turning the leaf yellow.

Fig 2: Angular leaf spot on calyces

Fig 3: Angular leaf spot causes small water soaked spots on lower leaf surface.

Tools for managing OBLR in apples

Kathryn Carter, Hannah Fraser and Margaret Appleby, OMAFRA

In recent years we have been seeing more obliquebanded leafroller damage in apple orchards. Late season leafroller damage can greatly slow harvesting crews since they need to look closely at the fruit for pin point holes. Effective management of this pest is important, and fortunately we have received a lot of excellent new products for managing obliquebanded leafrollers in apples.

One of the best ways of managing OBLR populations is using aggressive thinning and pruning to improve spray coverage and decrease fruit clustering. Varieties that have clustered fruit like Cortland, short stems like Macoun and tight leaf spacing like spur Red delicious are more susceptible to OBLR infestation since they provide a protective habitat for this pest.

There is widespread resistance to organophosphates (Imidan, Guthion) and pyrethroids in OBLR populations in Ontario. Although these products may be cheaper than newer reduced risk products they are not effective in managing OBLR and as a result using them will result in increased damage at harvest and reduced yields. New products are all registered at the lowest efficacious rate, and the efficacy trials conducted with these products are done on high density plantings. So while it is tempting to think about reducing the rates (Tree row volume) or applying alternate row sprays, these products work best if applied at the label rate. Larvae must consume products for maximum control. Good coverage is essential to managing leafrollers, so ensure equipment is calibrated. Be aware that some products (Success, Delegate, Dipel, Foray and Bioprotec) require pH adjustments to optimize product efficacy. Alternate the use of different chemistries between generations. Do not apply the same product against successive generations. If you need to apply 2 sprays for a generation—use the same product.

Table 1.0 Products available for managing OBLR

Product	Chemical name	Family	Life stage targeted	How it works	Timing	Residual	Comments
Delegate	spinetoram	naturalyte	larvae	ingestion	240 -280 DDC after biofix (base 6.1)	14 days+	pH of 6-8
Success	spinosad	naturalyte	larvae	ingestion	240 -280 DDC after biofix (base 6.1)	7-10 days	pH >6.0
Intrepid	methoxy-fenozide	IGR (MAC)	eggs, larvae, adults (sub-lethal)	ingestion, residue applied over top of eggs	240-280 DDC	14+	In some areas in US they recommend applying a little earlier (~ 50 DDC) so the larvae will consume it when they feed on their eggshells upon emergence. We do not recommend this early application, since early applications may not have residual to control late emerging larvae. Cross resistance between OP insecticides and Confirm is documented in Ontario. Cross resistance with OP and Intrepid has not been documented in Ontario but has been observed in other regions. Growers with high pest populations may benefit from applying these products earlier.
Altacor	chloran-traniliprole	ryanodine receptor modulator	ovicidal, larvicidal, and adultacidal	Ingestion and contact.	240-280 DDC	14+	Growers with high pest populations may benefit from applying these products earlier.
Dipel/ Foray/ Bioprotect	Bt	B.t. microbial	larvae	ingestion	Apply Apply at dusk or on overcast days.	5-7 day	Not the best product for summer generation because it is photosensitive. pH <7.0

Tips on managing Obliquebanded leafroller (OBLR) in Ontario apple orchards

Kathryn Carter, Hannah Fraser and Margaret Appleby, OMAFRA

Adult obliquebanded leafroller (OBLR) moths have started to emerge and fly in many areas and growers are making decisions on whether to manage this pest, and what products to use if necessary. OBLR has been a problem in many areas in Ontario, however there has been an increased incidence of leafroller damage in Norfolk orchards in the past few years. Damage from OBLR larvae is particularly troublesome in orchards late in the season. Pin point damage from these late feeding larvae to the fruit, can slow the picking crews down considerably during grading at harvest. It is too late to manage larvae once damage is present, so targeting the larvae that emerge from these adults is the last opportunity to avoid late season damage.

OMAFRA recommends petal fall sprays in orchards that have historical problems with OBLR, or have high populations in the spring. Before determining whether management may be necessary for the summer generation of OBLR, it is important to be aware of the extent of overwintering larvae which survived petal fall treatments. Monitoring for the presence of larvae and damage from the summer generation is important to determine if summer sprays are needed for this pest. More growers are applying petal fall sprays for leafrollers, and excellent products are available for managing this pest, so we are seeing fewer overwintering larvae surviving.

While trap catches and the use of developmental models provide useful information on timing insecticides for the summer generation, they do not provide an adequate indication of the abundance or potential damage from leafrollers in orchards. Trap catches vary depending on the placement of the traps in the orchard, and they can attract insects both from within the orchard and from neighbouring habitats. Thus trap counts do not provide an adequate evaluation of OBLR populations or the potential for damage in the orchard. Larval assessments should always be used to determine if management of summer generation OBLR is necessary.

It is important to predict when larvae should begin to appear in orchards, since they can be overlooked during monitoring. Traps are placed in the orchard at petal fall and models are triggered after first sustained moth catch occurs. 50% catch of the overwintering generation occurs at 77.8 DDC, base 6.1°C after biofix. 1% egg hatch begins at 244 DDC, base 6.1°C and 95% egg hatch occurs at 433 DDC base 6.1C). Immature larvae are very small and can be difficult to see. Small larvae are present at 500 DDC, and mostly large larvae are present at 666 DDC (Brunner et al., 1997). Larvae initially feed on tender growing terminals, water sprouts and developing fruit, however after the 3rd instar, larvae often cause more damage to fruit. Monitor for emerging larvae by examining 10 shoots on 10 trees for the presence of larvae or feeding damage. Also check 10 fruit from 10 trees for the presence of damage. Larvae are approximately 25 mm in length when full grown, and are green in colour with a brown or black head capsule. Often damage is more apparent in orchards than are larvae. Larvae roll leaves forming a shelter and use silk webbing to attach leaves to a fruit or to attach leaves together. Management is recommended if 1-2% of the terminals or fruit are infested. The orchard should be re-sampled again in the next 3-5 days to ensure that the population wasn't underestimated.

If sprays are necessary OMAFRA recommends applying an insecticide at 240-280 DDC (base 6.1° C) when larvae are active in the orchard. For those of you that are internet savey you are probably aware there are several different phenology models published on obliquebanded leafroller, and each model has a different minimum threshold (ranging from 6.0, 6.1,7.2, 10, or 10.8° C) and maximum threshold. The most recent published research from Washington suggests that the lower threshold is 10° C and the upper threshold is 30° C from egg to adult are 10° C to 30° C. This model suggests that at temperatures above 30° C developmental rates of leafroller larvae are reduced, and increased mortality of larvae occurs at 34 or 36° C. Traditionally we have not used an upper threshold for our model in Ontario. This upper threshold may explain why in some years (particularly hot years) our model predicts larval emergence earlier than when we see the larvae appearing in orchards. We are hoping to evaluate this newer model under field conditions in Ontario, but at present, we continue to use that developed by Brunner et al. (2007). Timing is very important when managing OBLR. Although we used to think that targeting the small larvae was critical in OBLR control, Dr. Pree (formerly of AAFC) found that the insecticides worked just as well against older larvae as they do against young larvae. It is most important that products are not applied too early. OBLR emergence can occur over an extended period of time and applying products too early can leave little residue to manage late emerging OBLR, and may cause growers to have to re-apply another insecticide.

OMAFRA received funding from the Ontario Fruit and Vegetable Convention last year to initiate a trial evaluating the thresholds developed in Washington under Ontario conditions. Preliminary results from last year indicated that the model we are currently using in Ontario was more accurate than this new model for our conditions, however we are continuing this study this year so stay tuned for more results.

Revised Grape Disease/Fungicide Options Table, 2008

A few errors were found in the table after it went to press (of course!)

- The Immediate post-bloom section was omitted. See below. Bot sprays are required only in very susceptible varieties at this time if the bloom period was wet. Sovran/Flint and Lance may provide some suppression of bloom infections.
- Through a label expansion, Ridomil Gold MZ is now available for one post-bloom spray. Be aware that the PHI is 66 days for this product.
- Serenade Max is not prone to the development of resistance.
- Bayer CropScience recommends using Scala at **veraison** for optimum activity (as opposed to berry touch, as was indicated in the previous table.).

Growth Stage	Disease	Fungicides		
		PM	DM, Bl Rot or Phom	Bot
1-3 leaves	Phom (if there is a history)		captan Folpan	
3-5 leaves	Phom, PM	Sulphur	captan Folpan	
		Dikar		
20-25 cm shoot growth	Phom, PM, DM, Bl Rot	Sulphur Nova Lance Milstop	copper captan Folpan mancozeb Polyram Ridomil Gold MZ (DM)	
		Dikar		
Immediate pre-bloom	Fruit & Leaves PM, DM, Bl Rot	Sulphur Nova Sovran/Flint Lance	copper captan Folpan mancozeb Polyram Ridomil Gold MZ (DM)	
		Dikar		
Immediate post-bloom	Fruit & Leaves PM, DM, Bl rot	Sulphur Nova Sovran/Flint Lance	copper captan Folpan mancozeb Polyram	Rovral Vangard/Scala Elevate Serenade Max
		Dikar		
Berry touch	Leaves PM, DM Fruit Bot	Sulphur Lance Sovran/Flint MilStop Serenade Max	copper captan mancozeb Polyram	Vangard/Scala Elevate Serenade Max
		Dikar		
Veraison through early September	Leaves PM, DM Fruit Bot	Sulphur Lance Sovran/Flint MilStop Serenade Max	copper captan mancozeb Polyram	Vangard/Scala Elevate Serenade Max
Early September through Pre-harvest	Fruit Bot			Vangard Elevate Serenade Max