

# RASPBERRY INSECT & DISEASE MANAGEMENT SCHEDULE

FOR NOVA SCOTIA

**Nova Scotia Guide to Pest Management in Raspberry 2011**  
[Rasp 1-11]

**Authors**

**Rick Delbridge, Plant Pathologist, Delbridge Disease Management**  
**Dick Rogers, Entomologist, Wildwood Labs Inc.**

**Revised May 1, 2011 by**

**Peter Burgess, Horticulturist, AgraPoint International Inc.**  
**Sarah Wood, Ag Info Specialist, AgraPoint International Inc.**

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**Advice & Review:** **Dr. Rob Smith**, Research Entomologist  
Agriculture and Agri-Food Canada, Kentville, NS.

**Dr. Paul Hildebrand**, Research Scientist  
Agriculture and Agri-Food Canada, Kentville, NS.

**Review:** **John Lewis**, Fruit Crops Horticulturist  
AgraPoint International Inc, Kentville, NS.

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# Raspberry Insect & Disease Management Schedule

## Site Selection & Preparation

| Insect / Disease      | Note   |
|-----------------------|--|
| White Grubs           | Do not plant raspberries on land that has recently been in sod or in fields known to have a wireworm or white grub problem.  |
| Wireworms             |  |
| Raspberry Crown Borer | Crown borers, root weevils, and bud weevils can be a problem in old plantings and may pose a threat to nearby new plantings. Avoid planting near old plantings. Remove wild brambles from area surrounding commercial fields. See <a href="#">Established Plantings</a> section and <a href="#">Occasional Pests</a> section.  |
| Root Weevils          |  |
| Strawberry Bud Weevil |  |
| Phytophthora Root Rot |  |
| Verticillium Wilt     | Do not plant raspberries following potatoes or alfalfa or where <i>Verticillium</i> is known to occur. Effective control can be achieved with soil fumigation.   |
| Nematodes             | Several nematode species have been associated with poor growth of raspberries. The root lesion nematode is the most important with a threshold of 500-1000 nematodes per kilogram of dry soil. Summer following the year before planting will reduce nematode populations. In the fallow year, cultivate every few weeks during the summer to kill young weeds and to desiccate nematodes. Crop rotations using fall fescue, brome grass, or rye grass are less likely to increase nematode populations than crops such as soybeans, corn and clovers. Effective control of nematodes can also be achieved with soil fumigation. |

## Soil Fumigation

| Insect / Disease  | Product    | Rate / ha | Note  |
|-------------------|------------|-----------|---|
| Nematodes         | Telone II  | 170 L     | Lower rates are for fumigation of coarse (sandy) soils under ideal conditions. Rates are given for broadcast application, consult label for row, and muck soil, application rates.    |
| Verticillium Wilt | Telone C17 | 200-380 L | Vapam can be applied with an irrigation system. See label for directions. Some fumigants will also suppress certain weeds and control soil insects such as wireworms and white grubs. |
|                   | Vapam      | 470-900 L |   |

**FUMIGATION** should be done in September or early October in the fall prior to spring planting. Previous crop debris must be cultivated into the soil during the summer so that it is fully decomposed at the time of fumigation. One week prior to fumigation, till the soil to a depth of at least 25 cm to break clods and loosen the soil. The soil should be moist but not wet. Inject fumigant 15 to 20 cm deep and drag immediately to fill injector shank slits. Seal by rolling, cultipacking or with a light irrigation. For **Vapam only**, apply via sprinkler irrigation. Apply a minimum of 25mL of water per hectare. For fall fumigation, the soil can be left undisturbed until spring. Cultivate several times in the spring at one week intervals prior to planting to allow complete aeration of the soil. Heavy, wet, cold soils require longer to fully aerate. To prevent contamination do not cultivate deeper than the injection depth. Do not plant if you can still smell the fumigant. Read the label completely before handling fumigants. **Follow all safety precautions.**

## Established Plantings

| Insect / Disease  | Product <sup>1</sup>  | Rate / ha                     | Note  |
|---|---|-------------------------------|---|
| <b>Green tip (buds showing green tips not more than 1 cm in length)</b>                 |   |                               |   |
| Spur Blight / Anthracnose   | lime sulfur   | 3.5 L / 100L                  | Use with enough water volume to drip off plants (1000-1500 L/ha) <b>Do not apply beyond 1 cm green tip due to possible burning, particularly under warmer temperatures.</b>   |
| <b>Bud Cluster (when blossom buds begin to separate from one another)</b>               |   |                               |   |
| Raspberry Fruitworm (Adult stage)   | Diazinon 50WP   | 4.0 kg                        | 1.0 kg/1000 L water applied at rate of 0.5 L/plant (4000 L/ha)  |
|   | Diazinon 500EC  | 4.0 L                         | 1.0 L/1000 L water applied at 600 mL/plant (4000 L/ha)  |
|   | Malathion 25WP  | 8-10 kg                       | 4-5 kg/1000 L water at approximately 2000 L/ha; use at temperatures of 20°C or higher.  |
|   | Adult beetles skeletonize developing leaves and feed on buds. Larvae feed on berries. |                               |   |
| <b>Prebloom (before blossoms open)</b>  |   |                               |   |
| Spur Blight / Anthracnose   | Ferbam 76WDG  | 4.5 kg                        | Apply when new canes are 30 cm high. Use 2000 L of water.   |
|   | Tanos 50 DF   | 840 g                         | Apply to foliage and fruit and repeat on a 7 day interval. Make no more than 6 applications per year. Apply in sufficient water volume to ensure thorough coverage (250-800 L/ha)   |
| Anthracnose   | Pristine WG   | 1.3-1.6 kg                    | Begin applications prior to disease development and continue on a 7 to 14 day schedule. Use a shorter interval and/or higher rates when disease pressure is high. The maximum number of applications per season is 4. 24hr Re-entry interval if handling the fruit leaves or canes.   |
| Late Yellow Rust  | Topas 250E  | 0.5 L                         | Apply at first detection of disease and then 14 days later. Maximum of 2 applications per year.   |
| Strawberry Bud Weevil   | Malathion 25WP  | 8-10 kg                       | 4-5 kg/1000 L water at approximately 2000 L/ha; use at temperatures of 20°C or higher.  |
|   | Malathion 500EC   | 2.75 L                        | Use at temperatures of 20°C or higher.  |
| Small round holes in flower petals and clipped buds indicate the presence of this pest. |   |                               |   |
| Two-spotted Spider Mite   | Acramite 50WS   | 851 g/ha (= 15 pouches /4 ha) | <b>Maximum of 1 application per year.</b> Apply in a minimum of 500 L/ha to ensure adequate coverage of all leaf surfaces. <b>One day PHI. 12 hour restricted re-entry interval.</b> Is primarily effective on motile stages of mites.  |
| <b>Bloom (WARNING – Spraying insecticides during bloom is hazardous to bees)</b>        |   |                               |   |
| Fruit Rot   | Captan 80WDG  | 2.5 kg                        | Target bloom for fruit rot sprays. Apply 2-3 applications beginning at 5-10 % bloom and a second at full bloom. Varieties flower at different times so treat varieties separately. If wet weather persists apply additional applications. Create an open canopy with proper cane densities and trellising. This improves air circulation, increases light penetration and speeds up the drying of plant surfaces. See section on resistance. For Lance, 7-14 day schedule just prior to disease development and no more than 4 applications per year. |
|   | Maestro 80DF  | 2.5 kg                        |   |
|   | Rovral 50WP   | 2.0 kg                        |   |
|   | Elevate 50WDG   | 1.7 kg                        |   |
|   | Lance 70WDG   | 0.56 kg                       |   |
|   | Switch 62.5 WG  | 775 to 975 g                  | Make the first application during early bloom. A second application may be made 7 to 10 days later. <b>One of the actives in this product is persistent and may carryover. It is recommended that any products containing fludioxonil not be used in areas treated with this product during the previous season.</b> There is a rotation restriction on crops where this product is not registered.   |

## Raspberry Insect & Disease Management Schedule

|  |                                      |                               |  |
|--|--------------------------------------|-------------------------------|--|
|  | Pristine WG                          | 1.3-1.6 kg                    | Begin applications prior to disease development and continue on a 7 to 14 day schedule. Use a shorter interval and/or higher rates when disease pressure is high. The maximum number of applications per season is 4. 24hr Re-entry interval if handling the fruit leaves or canes.  |
|  | Tanos 50 DF                          | 840 g                         | Apply to foliage and fruit and repeat on a 7 day interval. Make no more than 6 applications per year. Apply in sufficient water volume to ensure thorough coverage (250-800 L/ha)  |
|  | Serenade Max                         | 3.0-6.0 kg/ha                 | <b>Serenade MAX and Serenade ASO are biopesticides that may only suppress the indicated diseases.</b> Begin applications at first sign of the disease or when conditions become conducive for disease development. Repeat as necessary on a 7-10 day interval. <b>May also control Bacterial blight (see product label).</b>       |
|  | Serenade ASO                         | 4.0-15.0 L/ha                 |  |
| Raspberry Fruitworm, Thrips, Leafhoppers | Malathion 25WP                       | 8-10 kg                       | Highly toxic to bees. 4-5 kg/1000 L water at approximately 2000 L/ha; use at temperatures of 20°C or higher. PHI 1 day.  |
|  | Surround WP                          | 12.5-25 kg/ha                 | <b>This is an OMRI listed control product and is suitable for organic production.</b> Apply in 500 L of water. Apply at 7-14 day intervals once initial infestation is detected. Use high rate for early applications. Do not exceed 25 kg/ha per application. <b>Aster Leafhoppers only</b>                                       |
| Obliquebanded leafroller                 | Delegate WG                          | 0.1-0.2 kg/ha                 | Apply at egg hatch to small larvae. Use higher rate for larger larvae or bigger populations. Maximum 3 applications per year with a minimum re-treatment interval of 5 days.   |
|  | Dipel 2X DF                          | 525-1125 g/ha                 | Treat when larvae are young, before the crop is damaged. Repeat applications at an interval sufficient to maintain control, 3-14 days. Spray volume of 600 L/ha  |
| Fireblight                               | BlightBan C9-1                       | 370-500 g/ha                  | <b>This is a bio-pesticide for fireblight suppression.</b> Apply in 1000-2000 litres of water per hectare. Maximum of three applications per year. First application at 15-20% bloom followed by a second application at full bloom. Use high rate under high disease pressure.  |
|  | Bloomtime Biological FD Biopesticide | 375 – 500 g/ha                | <b>For suppression only: Apply Bloomtime Biological FD Biopesticide, in 1000-2000 L of water/ha. Maximum of two applications per year. 1<sup>st</sup> application at 15-20% bloom, 2<sup>nd</sup> application at full bloom to petal fall. (PHI = 0 days)</b>  |
| Two-spotted Spider Mite                  | Acramite 50WS                        | 851 g/ha (= 15 pouches /4 ha) | <b>Maximum of 1 application per year.</b> Apply in a minimum of 500 L/ha to ensure adequate coverage of all leaf surfaces. <b>One day PHI. 12 hour restricted re-entry interval.</b> Is primarily effective on motile stages of mites.   |
| <b>Postbloom</b>                         |                                      |                               |  |
| Two-spotted Spider Mite                  | Apollo 500SC                         | 500 mL                        | Use only when mites become a problem. Do not use Apollo more than once per season. Determine mite developmental stages by monitoring before using Apollo. Apply Apollo when mites are mostly in the egg stage since it is effective against eggs and nymphs but not adults. Use 500-1000 L water/ha.                               |
|  | Kelthane 50W                         | 1.5-3.5 kg                    | In 1500-2000 L water/ha. Only one application per season   |
|  | Acramite 50WS                        | 851 g/ha (= 15 pouches /4 ha) | <b>Maximum of 1 application per year.</b> Apply in a minimum of 500 L/ha to ensure adequate coverage of all leaf surfaces. <b>One day PHI. 12 hour restricted re-entry interval.</b> Is primarily effective on motile stages of mites.   |
| Aphids                                   | Admire 240                           | 175 ml/ha                     | Apply Admire up to 3 times total per year in 300L of water /ha as a foliar spray. <b>Do not apply pre-bloom or during bloom or when pollinators are actively foraging.</b> If multiple applications are required allow 7 days between applications. Do not harvest berries within 4 days of application.                           |
| Leafhoppers                              | Admire 240                           | 175 ml/ha                     | Apply Admire up to 3 times total per year in 300L of water /ha as a foliar spray. <b>Do not apply pre-bloom or during bloom or when pollinators are actively foraging.</b> If multiple applications are required allow 7 days between applications. Do not harvest berries within 4 days of application. <b>(Suppression only)</b> |
|  | Surround WP                          | 12.5-25 kg/ha                 | <b>This is an OMRI listed control product and is suitable for organic production.</b> Apply in 500 L of water. Apply at 7-14 day intervals once initial infestation is detected. Use high rate for early applications. Do not exceed 25 kg/ha per application. <b>Aster Leafhoppers only</b>                                       |

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|   |                                  |                               |   |
|---|----------------------------------|-------------------------------|---|
| Caneborers                              | Admire 240                       | 467 ml/ha                     | Apply Admire up to 3 times total per year in 300L of water /ha as a foliar spray. <b>Do not apply pre-bloom or during bloom or when pollinators are actively foraging.</b> If multiple applications are required allow 7 days between applications. Do not harvest berries within 4 days of application. <b>(Suppression only) For suppression of Caneborers, apply when evidence of caneborer activity is noted (wilted cane tips, swelling near base of canes, eggs in slits in base of canes)</b>  |
| Cane borers and Crown borers            | Altacor                          | 215-285 g/ha                  | Apply to first instar when they are actively feeding in the cambium before they tunnel into the root, crown or canes. Apply in a minimum of 500 L/ha. <b>Do not make more than 3 applications per season. Do not apply more than once every 14 days. 3 day pre harvest interval. Caution should taken when applying near bloom.</b>   |
| White Grubs (Larvae of European Chafer) | Admire 240                       | 1.2 L/ha                      | <b>Ground application only (soil drench).</b> Apply in 200 L of water per hectare. Apply just prior to or during egg hatch. Application should be based on previous populations, monitoring and adult trapping. <b>Do not apply pre-bloom or during bloom or when pollinators are actively foraging.</b> Irrigation after application (5-10 mm) is required within 24hrs to get product into the root zone. >20 mm of rain or irrigation can cause the product to move out of the root zone too quickly. <b>Apply once per season and do not apply within 14 days of harvest.</b> |
| Fireblight                              | BlightBan C9-1                   | 370-500 g/ha                  | <b>This is a bio-pesticide for fireblight suppression.</b> Apply in 1000-2000 litres of water per hectare. Maximum of three applications per year. A third application should be applied immediately at post bloom.   |
| <b>Preharvest</b>                       |                                  |                               |   |
| Fruit Rot                               | Same as for <b>Bloom</b> period  |                               | Apply if wet weather persists during the ripening period.   |
| Aphids                                  | Same as <b>Post Bloom</b> period |                               |   |
| Leafhoppers                             | Same as <b>Post Bloom</b> period |                               |   |
| Caneborers                              | Same as <b>Post Bloom</b> period |                               |   |
| <b>Postharvest</b>                      |                                  |                               |   |
| Spur Blight / Anthracnose               | Ferbam 76 WDG                    | 4.5 kg                        | Apply immediately after harvest. Pruning out fruiting canes after harvest is also beneficial in reducing disease pressure..   |
|   | Tanos 50 DF                      | 840 g                         | Apply to foliage and fruit and repeat on a 7 day interval. Make no more than 6 applications per year. Apply in sufficient water volume to ensure thorough coverage (250-800 L/ha)   |
| Anthracnose                             | Pristine WG                      | 1.3-1.6 kg/ha                 | Begin applications prior to disease development and continue on a 7 to 14 day schedule. Use a shorter interval and/or higher rates when disease pressure is high. The maximum number of applications per season is 4. 24hr Re-entry interval if handling the fruit leaves or canes.   |
| Two-spotted Spider Mite                 | Agri-Mek 1.9% EC                 | 1 L                           | The manufacturer "makes no representation or warranty with respect to performance (efficacy) and/or crop tolerance (phytotoxicity) claims for this product when used to control two-spotted spider mites in caneberries."   |
|   | Nexter 75WP (Pyramite)           | 600 g/ 3000 L                 | 600g based on 3000 L/ha. This rate of water is considered high for raspberries and, if delivered, would result in a significant loss of product to runoff. Normally, 2000 L is sufficient as a dilute spray in raspberry, in which case the 600 g/ha (200 g/1000 L) could be adjusted accordingly. Nexter is effective against immature stages of two-spotted spider mite. At postharvest, mites will be in all stages, including many in the adult stage.  |
|   | Kelthane 50W                     | 1.5-3.5 kg                    | In 1500-2000 L water/ha. Only one application per season.   |
|   | Acramite 50WS                    | 851 g/ha (= 15 pouches /4 ha) | <b>Maximum of 1 application per year.</b> Apply in a minimum of 500 L/ha to ensure adequate coverage of all leaf surfaces. <b>One day PHI. 12 hour restricted re-entry interval.</b> Is primarily effective on motile stages of mites.  |

## Raspberry Insect & Disease Management Schedule

|             |                           |  |
|-------------|---------------------------|--|
| Aphids      | Same as Post Bloom period |  |
| Leafhoppers | Same as Post Bloom period |  |
| Caneborers  | Same as Post Bloom period |  |

<sup>1</sup> Refer to the Pesticide Information Summary table for a list of trade names and common chemical names.

<sup>2</sup> Unless otherwise stated, use at least 2000 L water per hectare.

## Occasional Pests

| Insect / Disease                    | Note   |
|-------------------------------------|--|
| <b>Diseases</b>                     |  |
| Late Yellow Rust                    | Remove alternate host (white spruce). Nova, and K81-6 have significant resistance. Boyne has partial resistance.   |
| Fireblight                          | A recent problem in the Maritimes, especially on the cultivars, K81-6 and Boyne. Remove and destroy diseased canes. Disinfect pruning shears between each cut. Do not over fertilize as vigorous succulent growth is very susceptible. Destroy wild brambles in the immediate vicinity. Purchase certified planting stock.   |
| Virus Diseases                      | Raspberries are susceptible to many virus diseases. Mosaic, leaf curl and crumbly berry are the most common. Mosaic and leaf curl are spread by aphids while crumbly berry is spread by the dagger nematode. Rogue out affected plants. Use certified nursery stock. Destroy nearby wild brambles. Do not plant new plantings near old ones.   |
| Crown Gall                          | Do not plant canes infected with crown gall. Avoid injury to the crown and roots of plants and maintain good soil fertility.   |
| Powdery Mildew                      | This disease is seldom a problem. Senator 70WP 1.1 kg/ha may provide some control.   |
| Phytophthora Root Rot               | On established plantings, apply 37 mL of Ridomil Gold 480EC per 100 m of row to the soil surface in a one meter wide band centred over the row. Apply one application prior to freeze-up (no later than November 30). On new plantings, apply in the spring after planting and again in the fall using the above rate. Do not apply later than November 30. On established plantings do not apply in the spring. Time applications prior to rain or irrigation. Aliette 80 WDG can be applied as a foliar application up to four times per year at 5.5 kg/ha to bearing and non bearing raspberries. Apply in the fall when conditions favor disease. Repeat in 3 to 4 weeks. Last application must be 30 days prior to leaf drop. Apply Aliette in the spring when there is 7 cm of new growth and repeat in 3 to 4 weeks. Pre-harvest interval is 60 days. Consider using raised rows. |
| Cane Botrytis                       | Cane Botrytis is caused by the same fungus that causes grey mold fruit rot. It attacks primocanes from mid-late summer to early fall. Wide rows and dense canopies favor the disease. Fungicides used for Botrytis fruit rot will help control cane Botrytis if the spray is directed at the entire cane. <b>Tanos 50DF, 840g/ha is registered for spur blight, anthracnose, Botrytis fruit rot, as well as cane Botrytis. Tanos may be used post-bloom and post-harvest for cane Botrytis control. Make no more than six applications per year.</b>   |
| <b>Insects*</b>                     |  |
| Raspberry <b>Cane Borer</b>         | Canes are girdled near the tip by 2 rings approximately 12 mm apart and 12-20 cm from a lateral tip. Cut off wilted tips below the rings in June & July. <b>Note Altacor registration for crane and crown borer listed in post bloom timing above.</b>   |
| Raspberry <b>Crown (Root) Borer</b> | Remove wild brambles from the area. Apply a drench to the crown area. Make two applications: when growth appears in the spring and in mid September - mid October. Further treatment may be necessary the following year. Apply Azinphos-methyl 50W, Sniper 50W, OR Guthion 50WP at 2.25-4.5 kg/ha, OR Sniper 240EC at 4.75-9.25 L/ha. Use 1600-1800 L water per ha. Apply to lower portion of canes and to the soil beneath the plants. Another alternative is to apply Diazinon 500EC OR 50WP, OR DZN 600EW at the same rates as for raspberry fruitworm. <b>Note Altacor registration for crane and crown borer listed in post bloom timing above.</b>  |
| Root Weevils                        | Different species of weevils feed on raspberry but the black vine weevil is the most common. Larvae feed on roots and crowns. Damage is suspected when adults feed on foliage producing characteristic notching (July & August). Apply as a foliar spray Azinphos-methyl or Guthion 50WP, 1.75 kg or Guthion 240SC; 3.5 L in 1600-1800 L water per ha. Apply at night when adult weevils are feeding on foliage.   |
| Raspberry Sawfly                    | The pale green sawfly larvae feed on the outer edge of leaves chewing out irregular holes and in some cases skeletonizing the foliage. Sprays timed to control raspberry fruitworm will also control sawfly.   |
| Raspberry Bud Moth                  | In the spring, the small, bright-red caterpillars emerge from the soil, climb up fruiting canes and tunnel into buds and laterals. There are no registered chemicals to control raspberry bud moth. However, Azinphos-methyl or Guthion as applied for crown borer control may provide control of bud moth if application is made prior to bud swell. Sanitation practices, such as removing and burning cane debris, will help. This pest is of particular concern in Newfoundland and is also known to occur in NB. Nova Scotia is in the distribution zone so producers should be on the outlook for it.  |

\* A thorough survey/inventory of raspberry insects in Nova Scotia has not been compiled and published. Therefore, it is highly advisable to monitor the crop for insects, learn more about insect identification, and be aware of potential problems and new pest species.

## PESTICIDE EMERGENCY CONTACT INFORMATION

| <b>Poison Control Centres</b> |                                     |   |
|-------------------------------|-------------------------------------|---|
| Nova Scotia                   | 800.565.8161 <b>or</b> 902.428.8161 | IWK, Halifax, NS  |
| New Brunswick                 | 911                                 | Ask for Poison Information                                      |
| Prince Edward Island          | 800.565.8161 <b>or</b> 902.428.8161 | IWK, Halifax, NS  |
| Newfoundland                  | 709.722.1110                        | Dr. Charles A. Janeway Child Health Care Centre, St. John's, NF |

| <b>Environmental Emergencies (Pesticide Spills)</b>    |              |
|--|--------------|
| Transport Canada Regional Operations Centre (24 hours) |              |
| Nova Scotia  | 800.565.1633 |
| New Brunswick  | 800.565.1633 |
| Prince Edward Island                                   | 800.565.1633 |
| Newfoundland   | 800.563.9089 |

## ABBREVIATIONS & CONVERSIONS

| <b>Formulation and Measurement Abbreviations</b> |                          |              |                                 |
|--|--------------------------|--------------|---------------------------------|
| FORMULATIONS                                     |                          | MEASUREMENTS |                                 |
| DF   | Dry flowable             | mL           | millilitre                      |
| EC,E,EW  | Emulsifiable concentrate | kPa          | kiloPascal                      |
| L  | Liquid                   | g            | gram                            |
| WDG  | Wettable dry granule     | L            | litre                           |
| WP,W   | Wettable powder          | BIU          | Billions of International Units |

| <b>Helpful Conversions*</b>                       |  |
|---|--|
| kPa X 0.14 = pounds per square inch (psi)         | millilitres X 0.035 = fluid ounces                 |
| hectares X 2.47 = acres                           | litres X 35 = fluid ounces                         |
| kilograms X 2.2 = pounds                          | litres X 0.22 = imperial gallons                   |
| kilograms per hectare X 0.89 = pounds per acre    | litres per hectare X 14.17 = fluid ounces per acre |
| kilograms per hectare X 0.40 = kilograms per acre | litres per hectare X 0.40 = litres per acre        |
|   | degree-days C X 1.8 = degree-days F                |

**\* Pesticide Units of Measurement**

It is not recommended to convert label rates to imperial units because there is a high probability of mathematical and rounding errors. Present day pesticides are formulated to have greater toxic effects in smaller amounts. Therefore, even small conversion errors can lead to the use of incorrect dosages (either too high or too low). Use metric – you will be glad you did!

## PESTICIDE INFORMATION SUMMARY

(Read product label for re-entry intervals, precautions, and other product specific details)

| COMMON NAME                            | TRADE NAMES                          | DAYS TO HARVEST                        | TOXICITY       |         |               |        |
|--|--------------------------------------|--|----------------|---------|---------------|--------|
|  |                                      |  | TO PRED MITES* | TO BEES | TO APPLICATOR |        |
|  |                                      |  |                |         | ORAL          | DERMAL |
| abamectin                              | Agri-Mek                             | For postharvest only                   | low            | high    | mod           | low    |
| azinphos-methyl                        | Azinphos-methyl, Sniper, Guthion     | 14                                     | high           | high    | high          | mod    |
| <i>Bacillus subtilis</i>               | Serenade Max                         | 0                                      | low            | mod     | low           | low    |
| <i>Bacillus thuringiensis</i>          | Foray, Dipel 2X DF                   | 0                                      | -              | low     | low           | low    |
| bifenazate                             | Acramite                             | 1                                      |                |         |               |        |
| boscalid                               | Lance                                | 0                                      | -              | low     | low           | low    |
| boscalid, pyraclostrobin               | Pristine                             | 0                                      | -              | low     | low           | low    |
| captan                                 | Captan, Maestro                      | 2                                      | low            | low     | low           | low    |
| chlorantraniliprole                    | Altacor                              | 3                                      | low            | mod     | low           | low    |
| clofentezine                           | Apollo                               | 15                                     | low            | low     | low           | low    |
| cyprodinil, fludioxonil                | Switch                               | 1                                      | -              | -       | low           | low    |
| diazinon                               | Diazinon                             | DO NOT use after bloom                 | mod            | high    | mod           | mod    |
| dicofol                                | Kelthane                             | 7                                      | mod            | low     | low           | low    |
| famoxadone / cymoxanil                 | Tanos                                | 0                                      | low            | low     | low           | low    |
| fenhexamid                             | Elevate                              | 1                                      | -              | low     | low           | low    |
| ferbam                                 | Ferbam                               | DO NOT use after berries begin to form | low            | low     | low           | low    |
| fosetyl-al                             | Aliette                              | 60                                     | -              | low     | low           | low    |
| imidacloprid                           | Admire                               | 4 (foliar)<br>14 (drench)              | mod            | high    | low           | low    |
| iprodione                              | Rovral                               | 1                                      | -              | low     | low           | low    |
| kaolin                                 | Surround                             | -                                      | low            | low     | low           | low    |
| lime sulfur                            | Lime Sulfur                          | DO NOT use after 6 mm green            | high           | low     | low           | low    |
| malathion                              | Malathion                            | 1                                      | low            | high    | low           | low    |
| metalaxyl-M                            | Ridomil Gold                         | Postharvest but no later than Nov 30   | -              | low     | low           | low    |
| <i>Pantoea agglomerans</i> strain C9-1 | BlightBan C9-1                       | -                                      | low            | low     | low           | low    |
| <i>Pantoea agglomerans</i> strain E325 | Bloomtime Biological FD Biopesticide | 0                                      | low            | low     | low           | low    |

## Raspberry Insect & Disease Management Schedule

|                                    |             |                      |     |      |      |      |
|------------------------------------|-------------|----------------------|-----|------|------|------|
| propiconazole                      | Topas       | 30                   | low | low  | low  | low  |
| pyridaben                          | Nexter      | For postharvest only | mod | -    | mod  | low  |
| spinetoram                         | Delegate WG | 1                    | low | high | low  | low  |
| thiophanate-methyl                 | Senator     | 1                    | low | low  | low  | low  |
| 1,3-dichloropropene                | Telone II   | Preplant in the fall | -   | -    | high | high |
| 1,3-dichloropropene & chloropicrin | Telone C-17 | Preplant in the fall | -   | -    | high | high |
| metam                              | Vapam       | Preplant in the fall | -   | -    | high | high |

\* Various beneficial species. If the commercially available organophosphate resistant strain of *Amblyseius fallacis* is used, then the toxicity of organophosphates to this species can be considered to be **low**.

## LABEL DEFINITIONS

**DAYS TO HARVEST** - Is the minimum number of days from the last application of the product to first harvest. This interval has been set to ensure that any residue of the pesticide left on the fruit at harvest is within an acceptable tolerance. Read the label and do not spray nearer to harvest, or later than the growth stage recommended.

**TOXICITY TO BEES** - Bees are important pollinators of raspberries. If a pesticide must be applied during the bloom period, choose products with the least toxicity to bees. Spray in late evening or early morning when bees are not present. Spray deposit should be dry before bees begin foraging. If you have rented bees, notify the beekeeper that you intend to spray. Give enough advance notice so that the bees can be moved. Do not allow pesticide spray to drift onto hives. The presence of large numbers of dead bees at the hive entrance may be an indicator of pesticide poisoning.

**TOXICITY TO PREDATORY MITES** – Two-spotted spider mites are a common pest of raspberries. Predatory mites help suppress two-spotted spider mite infestations. When possible, choose products and use patterns with the least toxicity to these beneficial mites.

**TOXICITY TO APPLICATOR** - Poisoning as a result of pesticide exposure can result from inhalation, ingestion (Oral), or absorption through the skin (Dermal). It is essential that protective clothing, respirator and eye protection are worn when handling products listed as having a high or moderate toxicity. However, since pesticides may also have adverse affects after long term sublethal exposures it is recommended that protective equipment be worn when using all pesticides. Some of the wettable powder (W or WP) formulations recommended in this guide are now available in low exposure packaging (Instapak, Solupak) or low dust formulations such as dry flowable (DF) and wettable dry granule (WDG). Use of these products reduces inhalation exposure during handling.

**RESISTANCE MANAGEMENT** - Current disease concerns are for the development of resistance in the fruit rot fungus to Elevate, Switch, Lance and Rovral (they are from different chemical families). To slow the development of resistance, use the products at full rates and rotate with other fungicides from different chemical families or groups. Avoid application of more than 2 consecutive sprays of the same fungicide or a fungicide from the same group. If additional protection or control is required, choose a product from another chemical family. Refer to the labels for more detailed information on resistance management.

**PESTICIDE POISONING** - If you suspect poisoning from exposure to a pesticide, consult the label for immediate first-aid instructions. Transport the person to your nearest hospital or call 911. Take the label information or the sealed pesticide container with you since it supplies treatment information. *The Pest Control Products Act Number (P.C.P. No.) on the label will enable the attending physician to obtain specific treatment guidelines from the Poison Control Centre.*

## HOW TO REDUCE / AVOID PESTICIDE USE

By applying good management practices, growers can sometimes reduce or eliminate the need for some pesticides. Good management practices include:

- Learn to recognize raspberry pests and diseases and their symptoms. For example, by scouting for the early signs of the strawberry bud weevil you can accurately time the application of control sprays. If the pest is not present then you may be able to eliminate sprays for this pest completely.
- Sanitation. Remove diseased canes from the field. Thinned or diseased canes left in the row can act as a source of infection for diseases such as anthracnose and fruit rot.
- Know the product you are using. Some products are more effective under specific conditions, such as temperature, or are only effective when the target pest is at a specific stage of development. Read the label.
- Use resistant varieties of raspberries. Varieties which are resistant to late yellow rust are available.
- Choose the planting site carefully. Wet, poorly drained soils can lead to root rot. The crops that had been previously planted in the field can potentially cause disease and pest problems. Planting raspberries in a field which has recently been in sod can lead to a white grub problem, while planting after potatoes can lead to Verticillium wilt. Consider using raised rows at least 25-30 cm high for root rot control. See extension service for methods.

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