

2023



EXTENSION AND ADVISORY TEAM

GUIDE TO INSECT AND DISEASE MANAGEMENT IN RASPBERRY

Nova Scotia Guide to Pest Management in Raspberry 2023
[Rasp 1-23]



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LIABILITY STATEMENT

Recommendations in this guide are given for general information only and do not give the user the right to use a product in a manner not in accordance with the pesticide label or Pest Control Products Act. Perennia, by funding and printing this publication, and the editors/authors, do not offer any warranty or guarantee and do not assume any liability for crop loss, animal loss, health, safety, or environmental hazard caused by the use of any pesticide, advice, or recommendation in this schedule. Pesticides used in this schedule are products labeled for the target and crop. This information was retrieved from the Pest Management Regulatory online of Registered Products Database. The list of products presented in this schedule is intended to be complete, based on products known to be available in the region, but in no way is guaranteed to be complete. Some of the products listed may not be available. Trade names are given as a convenience to producers and are neither an endorsement of the product nor a suggestion that similar products are not available or effective.

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ACKNOWLEDGMENTS

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PESTICIDE EMERGENCY CONTACT INFORMATION

| Poison Control Centres | | |
|------------------------|------------------------------|---|
| Nova Scotia | 800.565.8161 or 902.470.8161 | IWK, Halifax, NS |
| New Brunswick | 911 | Ask for Poison Information |
| Prince Edward Island | 800.565.8161 or 902.470.8161 | IWK, Halifax, NS |
| Newfoundland | 709.722.1110 | Dr. Charles A. Janeway Child Health Care Centre, St. John's, NF |

| Environmental Emergencies (Pesticide Spills) | |
|--|--------------|
| 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 AND CONVERSIONS

| Formulation and Measurement Abbreviations | | | |
|---|---------------------------|-----|---------------------------------|
| DF | Dry flowable | g | gram |
| EC, E, EW | Emulsifiable concentrate | kg | kilogram |
| EG | Water dispersible granule | kPa | kiloPascal |
| L | Liquid | l | litre |
| WDG | Wettable dry granule | ml | millilitre |
| WP or W | Wettable powder | BIU | Billions of International Units |
| SC | Suspension concentrate | ppm | Parts per million |

| Label Abbreviations | |
|---------------------|---------------------------|
| PHI | Pre-Harvest Interval |
| REI | Restricted Entry Interval |

| Helpful Conversions ¹ | |
|---|--|
| 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 |

¹ 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 be more effective in smaller amounts. Therefore, even small conversion errors can lead to the use of incorrect rates (either too high or too low). Use metric – you will be glad you did!

TOXICITY TABLE

| LD ₅₀ (mg/kg) | Hazard Rating | Relative Toxicity Rating |
|--------------------------|---------------------|--------------------------|
| Above 500 | Very Low Hazard | 1 |
| 101-500 | Low Hazard | 2 |
| 21-100 | Moderate Hazard | 3 |
| 11-20 | Very High Hazard | 4 |
| 10 and less | Extremely Hazardous | 5 |

Emergency and First-Aid Procedure for Pesticide Poisoning

- Become familiar with the chemicals you are using. Keep a list of common names in case of accidents or emergencies. This information can be found on product labels cross-referenced in this publication.
- If a pesticide has come in contact with the skin or has been spilled on clothing, remove the clothing and wash the skin thoroughly with soap and warm water.
- If a person suspects poisoning from exposure to a pesticide by swallowing, inhalation or contact with skin or eyes, read the label of the pesticide container and carry out first-aid treatment as suggested.
- Immediately after first-aid treatment has been given, wrap the patient in a coat or blanket and rush him/her to the nearest hospital. Take the list of chemical common names with you and identify the one being used.
- If a person is unconscious or lapses into unconsciousness, call **911** immediately.
- Emergency advice on pesticide poisoning is available from the Regional Poison Centre, Halifax, NS. Phone 1-800-565-8161 (NS & PEI)

Raspberry Insect & Disease Management Schedule

| Insect / Disease | Note |
|---|--|
| SITE SELECTION & PREPARATION | |
| 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 Established Plantings and Occasional Pests sections. |
| Root Weevils | |
| Strawberry Bud Weevil | |
| Phytophthora Root Rot | <p>Avoid poorly drained soils and fields with a history of this disease. Do not introduce the disease to clean fields by planting infected plants. Planting tissue culture plants produced in soilless culture can prevent introduction of this disease into the field. Purchase certified planting stock. Research indicates that a 30 cm high raised row effectively reduces root rot severity. In some areas, however, this may result in increased risk of winter injury to roots. No commercial cultivars adapted to the Atlantic region have adequate resistance to Phytophthora root rot. Ridomil Gold is registered as a spring and fall treatment on new beds and as a fall treatment on established beds. Aliette is registered for spring and fall treatments. Phostrol can be used for preventative suppression of phytophthora root rot in new plantings; begin applications when the plants produce new growth of 1-3 inches. See Occasional Pests section.</p> <p>Orondis – Apply at a rate of 1.4 – 2.8 L/ha. Apply to soil directly with a banded drench application at a minimum of 200L/ha on a 7–14-day interval. Follow by sprinkler or drip irrigation within 24 hours to adequately distribute the product to the root zone. Use 1-2 applications at 7-14 days apart made in spring and 1-2 applications at 7-14 days apart in the fall.</p> |
| Verticillium Wilt | Do not plant raspberries following potatoes or alfalfa or where Verticillium 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. |

| Insect / Disease | Product | Rate/ha | Note |
|----------------------------|--------------------------|-----------|---|
| SOIL FUMIGATION | | | |
| Nematodes (<i>cont.</i>) | Pic Plus Fumigant | 108 L | Broadcast application only. For control of root knot and root lesion nematodes. Read label for application instructions |
| | Chloropicrin 100 | 93 L | |
| Verticillium Wilt | Vapam | 470-900 L | May 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. |
| | Pic Plus Fumigant | 108 L | Broadcast application only. Also, for Phytophthora. Read label for application instructions. |
| | Chloropicrin 100 | 93 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, covering treated area with a plastic tarpaulin or with a light irrigation. For **Vapam only**, apply via sprinkler irrigation. Apply a minimum of 25mm 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 | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|--|---|--|--|--|---------|---|
| DELAYED DORMANT TO GREEN TIP (BUDS SHOWING GREEN TIPS NOT MORE THAN 1 CM IN LENGTH) | | | | | | |
| Spur Blight/ Cane Blight/ Rust | M | Lime Sulfur | 2.6L/100L water at 1000-1500 L/ha water | 48 hrs | - | Thorough coverage to the point of foliage run off is important. Do not apply past 1 cm green tip stage. |
| Scale | NC | Purespray Green Spray Oil 13E <i>NEW USE 2023</i> | 20 L per 1000 L water | 12 hrs | - | Maximum of two dormant applications per year if summer spray applications are expected during the growing season. |
| EARLY BUD BREAK (WHEN BLOSSOM BUDS BEGIN TO SEPARATE FROM ONE ANOTHER) | | | | | | |
| Raspberry Fruitworm (Adult stage) | Adult beetles skeletonize developing leaves and feed on buds. Larvae feed on berries. At the time of publication, there were no products registered for use on Raspberry Fruitworm. | | | | | |
| Raspberry Crown Borer | 1B | Diazinon 500E | 1L/1000L water | 12 hrs | - | Apply in spring to control young larvae before they tunnel into the crowns and when new growth is about 10cm above ground. Do not apply more than once/year. Do not apply during and after bloom. |
| Phytophthora Root Rot | 33 | Phostrol | 5.2 L/ha | 12 hrs | 0 days | Suppression only. Use as a preventative treatment. |
| | P07 | Aliette | 5.5 kg/ha | 12 hrs/ 2 days (handset irrigation) | 60 days | Use as a preventative treatment. Maximum 4 applications per year – 2 in spring and 2 in fall. The last application should be made 30 days prior to leaf drop. |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|---|---|--|------------|---|--|---|
| PRE-BLOOM (BEFORE BLOSSOMS OPEN) | | | | | | |
| Spur Blight/ Anthracnose | 7+11 | Pristine WG | 1.3-1.6 kg | 24 hrs | 0 days | Anthracnose only. Begin applications prior to disease development, continue 7–14-day schedule. Use shorter interval and/or higher rates when disease pressure is high. Max. 4 applications/season. |
| | 11+27 | Tanos | 840 g/ha | 9 days | 9 days | Apply to foliage and fruit and repeat on a 7-day interval. Maximum 3 applications per year. |
| | P05 | Regalia Rx <i>NEW USE 2023</i> | 5-10 L/ha | When dry | 0 days | Biopesticide. Suppression only. Initiate application preventatively at bud break. Repeat applications at 7–10-day intervals. |
| Late Yellow Rust | Remove alternate host (white spruce). Nova and K81-6 have significant resistance. Boyne has partial resistance. | | | | | |
| | 3 | Tilt 250E | 0.5 L/ha | 12 hrs | 3 days | Apply at first detection of disease and then 14 days later. Maximum 2 applications per year. |
| | | Propi Super 25EC | 500 ml/ha | 12 hrs | 30 days | Apply by ground application at first detection of disease in the field and then 14 days later. Max of two applications per season. |
| | | Nova | 175 g/ha | 12 hrs | 1 day (hand harvest)/ 6 days (mechanical harvest) | Begin at early bud break when new growth is 3-4 inches or at first sign of yellow rust pustules. Apply in 250 L/ha at 10–14-day intervals. |
| 7 | Fontelis | 1.0-1.75 L/ha | 12 hours | 0 days | Make no more than 2 sequential applications before switching to a fungicide with a different mode of action. Do not mix or rotate with oil-based products. | |
| Clipper Weevil | Small round holes in flower petals and clipped buds indicate the presence of this pest. | | | | | |
| | 1B | Malathion 85E | 1345 mL/ha | 12 hrs/ 24 hrs (handset irrigation) | 1 day | Maximum 2 applications per year. |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|-------------------------|---|---|---|--|-------------|--|
| Two-spotted Spider Mite | 6 | Agri-Mek 1.9% EC | 1 L/ha | 12 hrs/ 3 days (hand-set irrigation) | 7 days | Apply first application when mites appear. Reapply on a 7-day interval if monitoring indicates necessity. Toxic to bees. Do not apply during bloom. |
| | 10 | Apollo | 500 mL/ha | 12 hrs/ 10 days (hand pruning/training/tying) | 15 days | Kills mite eggs and young nymphs. Apply when mites are mostly in the egg stage. |
| | 20B | Kanemite 15 SC | 2.07 L/ha | 12 hrs | 1 day | Apply as a full coverage spray to foliage to drip. Apply as soon as mite population reaches economic infestation levels. Allow minimum of-21 day application interval. |
| | 20D | Acramite 50WS | 851 g/ha | 12 hrs | 1 day | Maximum 1 application per year. Apply in a minimum of 500 L water/ha to ensure adequate coverage of all leaf surfaces. Primarily effective on motile stages of mites. |
| | 23 | Oberon | 880-1160 mL/ha | 12 hrs | 3 days | Maximum 3 applications per season. Also, for control of McDaniel Spider Mite. |
| | NC | Purespray Green Spray Oil 13E Vegol Crop Oil | 10L in 1000 L/ha water 2% v/v in 700-1900 L/ha water | 12 hrs 12 hrs | - 0 days | Suppression only. Begin when mites appear. Apply at 7 – 14-day intervals. Do not apply more than 8 summer spray applications per growing season. Do not apply within 48 hours of freezing or 30°C, or prior to rain/heat/moisture stressed crop. |
| Bacterial blight | M1 | Cueva | 0.5-2.0% solution at 470-940 L/ha water | 4 hrs | 1 day | Apply at the start of flowering and continue every 7 to 10 days. |
| Raspberry Fruit Worm | Adult beetles skeletonize developing leaves and feed on buds. Larvae feed on berries. At the time of publication, there were no products registered for use on Raspberry Fruitworm. | | | | | |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|--|--|-----------------------------|------------------------------------|---------------------|--|---|
| BLOOM (WARNING – SPRAYING INSECTICIDES DURING BLOOM IS HAZARDOUS TO BEES) | | | | | | |
| Botrytis Fruit Rot | 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, make additional applications. Create an open canopy with proper cane densities and trellising. This improves air circulation, increases light penetration and speeds up drying of plant surfaces. See section on resistance. | | | | | |
| | 1 | Senator 50 SC | 700 mL/1000 L of water (1.54 L/ha) | 12 hrs | 1 day | Apply during flowering and repeat every 7 - 10 days as necessary. May also control powdery mildew. See product label. |
| | 2 | Rovral WDG | 2.0 kg/1000L of water/ha | 12 hrs | 1 day | Apply a maximum of 8 applications per year. Begin when flower buds are visible in the crown and repeat on 7–10-day intervals. Apply by ground. |
| | 7 | Cantus WDG | 0.56 kg/ha | 12 hrs | 0 days | 7–14-day schedule just prior to disease development and no more than 4 applications per year. |
| | | Kenja 400 SC | 0.987-1.24 L/ha | 12 hrs | 7 days | Use once then rotate to another fungicide group. |
| | | Sercadis | 250-666 mL/ha | 12 hrs | 0 days | Suppression only. |
| | 7+9 | Luna Tranquility | 1200 mL/ha | 12 hrs | 0 days | Begin fungicide applications preventatively. Make first application at early flowering and repeat applications as required at 7–10-day intervals. |
| | 7+11 | Pristine WG | 1.3-1.6 kg | When dry/ 24 hrs | 0 days | Begin applications prior to disease development and continue on a 7–14-day schedule. Use a shorter interval and/or higher rates when disease pressure is high. Maximum 4 applications per season |
| | 9 | Scala SC | 2 L/ha | 12 hrs | 0 days | Begin applications preventatively. Maximum 2 applications per growing season. |
| | 9+12 | Switch 62.5 WG | 775-975 g/ha | 12 hrs | 1 day | Begin applications during early bloom. Persistent active that may carryover. Products containing fludioxonil should not be used in areas treated with this product during the previous season. |
| 11+27 | Tanos 50 DF | 840 g in 250-800 L/ha water | 9 days | 9 days | Apply to foliage and fruit and repeat at least 12 days later. Maximum 3 applications per year. | |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|--------------------------------------|-------|---|--|---|--------|---|
| Botrytis Fruit Rot (cont.) | 17 | Elevate 50WDG | 1.7 kg/ha | 12 hrs/ 1 day (hand harvest) | 1 day | Begin applications at 10% bloom. Maximum 4 applications per year. |
| | 19 | Diplomat 5SC | 463-926 mL/ha | When dry | 0 | Suppression only. Begin as a preventative application when conditions favour disease development. |
| | M4 | Supra Captan 80WDG | 2.5 kg/ha | 12 hrs/ 7 days (handset irrigation)/ 6 days (hand harvest) | 2 days | Do not use within 14 days of oil or as a tank-mix or sequential application with Exirel. Maximum 6 applications per year. |
| | | Maestro 80 WSP | | | | |
| | P05 | Regalia Rx NEW USE 2023 | 5-10 L/ha | When dry | 0 days | Biopesticide. Suppression only. Initiate application preventatively at bud break. Repeat applications at 7–10-day intervals. |
| | BM01 | Timorex Gold | 1.5-2.0 L/ha in 400-1200 L/ha spray volume | 4 hrs | 2 days | For preventative treatments, apply at 7–14-day intervals, depending on disease level. Use the shorter application interval under conditions that promote rapid disease development. |
| | BM02 | Serenade Opti | 1.7-3.3 kg/ha | When dry | 0 days | Suppression only. 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. |
| | BM02 | Serifel | 0.25-0.5 kg/ha | 4 hrs/ when dry | 0 days | Begin applications prior to infection and continue on 2–10-day intervals if conditions are favorable for disease development. |
| | NC | OxiDate OxiDate 2.0 NEW USE 2023 | 1.0% v/v | 4 hrs/ when dry | 0 days | Apply prior to or in early stages of disease. Avoid application before rain. |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|------------------|-------|---|--------------------------------------|--------------------|--------|---|
| Fireblight | 24 | Kasumin 2L | 5.0 L/ha | 12 hrs | 1 day | Begin applications at beginning of bloom and continue every 3-4 days under conditions favouring disease development. Under cool conditions apply every 5-7 days. Maximum 4 applications per year. Do not make more than two consecutive applications. |
| | NC | BlightBan C9-1 | 370-500 g/ha in 1000-2000 L/ha water | 4 hrs | - | Suppression only. First application at 15-20% bloom, second application at full bloom, third application immediately post bloom. Use high rate under high disease pressure. Maximum 3 applications per year. |
| | | Buran <i>NEW USE 2023</i> | 1.4% (500-800 L water/ha) | When dry | 0 days | Apply before wetting events when conditions are conducive to infection. |
| | | OxiDate OxiDate 2.0 <i>NEW USE 2023</i> | 1.0% v/v | 4 hrs/ when dry | 0 days | Partial suppression only. Apply prior to or in early stages of disease. Avoid application before rain. |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|--------------------------------|-------|--------------------------------------|--|---|---------------------------------|---|
| POST-BLOOM/GREEN FRUIT | | | | | | |
| Two-spotted Spider Mite | 6 | Agri-Mek 1.9% EC | 1 L/ha | 12 hrs/ 3 days (handset irrigation) | 7 days | Pre-harvest: Apply first application when mites appear. Reapply if monitoring indicates necessity. Application interval 7 days. Maximum 3 applications per season. |
| | | Agri-Mek SC | 225 mL/ha 0.1-0.5% v/v non-ionic surfactant | 12 hrs/ 3 days (handset irrigation) | 7 days | Pre-harvest: Apply first application when mites appear. Reapply if monitoring indicates necessity. Application interval 7 days. Maximum 3 applications per season. Apply as a full coverage spray to the foliage to drip. |
| | 20B | Kanemite 15 SC | 2.07 L/ha | 12 hrs | 1 day | Application should be made as soon as the mite population reaches economic infestation levels. Allow a minimum of 21 days between applications. |
| | 20D | Acramite 50WS | 851 g/ha in min 500L/ha water | 12 hrs | 1 day | Maximum 1 application per year. Primarily effective on motile stages of mites. |
| | NC | Vegol Crop Oil | 2% v/v in 700-1900 L/ha water | 12 hrs | 0 days | Do not apply in extreme high or freezing temperatures. See label for product restrictions. |
| | | Purespray Green Spray Oil 13E | 10 L in 1000 L water | 12 hrs | - | Begin when mites appear. Apply at 7–14-day intervals. Do not apply more than 8 summer spray applications per growing season. |
| Aphids | 1A | Sevin XLR | 5.25 L/ha | 6-10 days, dependent on the activity | 11 days | <i>Blackberry leafminer, Japanese beetle, Leafhoppers, Leafrollers, Rose stem girdler, Spotted-winged raspberry aphid.</i> Apply when insects or damage appear. |
| | 3 | Danitol | 779-1169 mL/ha | 7-15 days, dependent on the activity | 15 days (hand harvesting) | Apply with ground equipment in adequate water for uniform coverage (minimum of 200 L/ha by ground). Begin applications when first pest activity is noticed. A second application may be used with a minimum application interval of 14 days |
| | 4 | Aceta 70 WP | 56-86 g/ha in minimum 187 L/ha water | 12 hrs | 1 day | Max 4 applications per season. Use a 7-day re-treatment interval. Use high rate under heavy pressure. |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|-------------------------|---------------------------------|-------------------------------------|--|-------------------------------|--------|--|
| Aphids (<i>cont.</i>) | 4 | Assail 70 WP | 56-86 g/ha in minimum | 12 hrs | 1 day | Max 4 applications per season. Use a 7-day re-treatment interval. Use high rate under heavy pressure. |
| | 4A | Admire 240 | 187 L/ha water 175 mL/ha in 200 L/ha water | 12 hrs | 4 days | Do not apply pre-bloom or during bloom or when pollinators are actively foraging. If multiple applications are required allow 7 days between applications. |
| | 4D | Sivanto Prime | 500-750 mL/ha | 12 hrs | 0 days | Toxic to some beneficial insects. |
| | NC | Purespray Green Spray Oil 13E | 10 L in 1000 L water | 12 hrs | - | Begin when aphids appear. Apply at 7–14-day intervals. Do not apply more than 8 summer spray applications per growing season. |
| | | | Vegol Crop Oil | 2% v/v in 700-1900 L/ha water | 12 hrs | 0 days |
| | - | Pyganic EC 1.4 II | 2.32-4.65 L/ha | 12 hrs | - | Apply when pests are first observed. Do not wait until plants are heavily infested. Reapply if needed. Do not use when other beneficial insects are present. |
| Raspberry Cane Borers | 4 | Alias 240 SC | 467 mL/ha in 200 L/ha water | 24 hrs | 4 days | Suppression only. Apply when evidence of cane borer activity is noted, allowing at least 7 days between applications. Maximum 3 applications per season. Do not apply pre-bloom or during bloom or when pollinators are actively foraging. |
| | 4A | Admire 240 | 467 mL/ha in 200 L/ha water | 12 hrs | 4 days | |
| | 28 | Altacor | 215-285 g/ha in minimum 500 L/ha water | 12 hrs | 3 days | Apply to first instar when they are actively feeding in the cambium before they tunnel into the root, crown or canes. Maximum 3 applications/645 g per year. It is recommended that products containing chlorantraniliprole not be used in areas treated with this product during the previous season. Do not apply more than once every 14 days. Caution should be taken when applying near bloom. |
| Botrytis Fruit Rot | Same as for Bloom period | | | | | |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|---------------------------|--|----------------------------|---|--------------------------------------|---|--|
| PRE-HARVEST | | | | | | |
| Botrytis Fruit Rot | Same as for Bloom period Apply if wet weather persists during the ripening period. | | | | | |
| Aphids | 4 | Assail 70 WP | 56-86 g/ha | 12 hrs | 1 day | Use a 7-day spray interval. Use the high rate under heavy pressure. Maximum two applications from group 4A per season. Apply post-bloom when aphids are first observed. |
| | 23 | Movento 240 SC | 220-365 mL/ha in minimum 300 L/ha water | 12 hrs | 3 days | Maximum total application amount of 1095 mL/ha per year. |
| Leafhoppers | 1B | Malathion 85E | 880 mL/ha | 24 hrs | 1 day | Maximum 2 applications per year. |
| | 3 | Danitol | 779-1169 mL/ha | 7-15 days, dependent on the activity | 15 days (hand harvesting) | Apply with ground equipment in adequate water for uniform coverage (minimum of 200 L/ha by ground). Begin applications when first pest activity is noticed. A second application may be used with a minimum application interval of 14 days. |
| | 4 | Alias 240 SC | 175 mL/ha | 24 hrs | 4 days | Do not apply pre-bloom or during bloom. |
| | | Aceta 70 WP | 56-86 g/ha | 12 hrs | 1 day | Use a 7-day spray interval. Use the high rate under heavy pressure. Maximum two products from group 4 per season. |
| | | Assail 70 WP | | | | |
| | 4A | Admire 240 Flowable | 175 mL/ha in 300 L/ha water | 12 hrs | 4 days | Under high pressure, may provide suppression rather than control. Maximum two products from group 4 per season. |
| | NC | Surround WP | 12.5 - 25 kg/ha | - | 0 days | Apply at 7–14-day intervals when leafhoppers first detected by monitoring. Do not use when fruit is present or during bloom. |
| - | Pyganic EC 1.4 II | 2.32-4.65 L/ha | 12 hrs | - | Do not reapply more often than every 7 days. Toxic to bees. | |
| Caneborers | Same as Post Bloom/Green Fruit period | | | | | |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note | |
|-----------------------------------|-------|------------------------------------|----------------|---|---------------------------------|--|--|
| Spotted wing <i>Drosophila</i> | 3 | Danitol | 779-1169 mL/ha | 7-15 days, dependent on the activity | 15 days (hand harvesting) | Apply with ground equipment in adequate water for uniform coverage (minimum of 200 L/ha by ground). Begin applications when first pest activity is noticed. A second application may be used with a minimum application interval of 14 days. | |
| | | Mako | 150-175 mL/ha | 12 hrs | 2 days | | |
| | | Ship 250 EC <i>NEW USE 2023</i> | 245-285 mL/ha | 12 hrs | 2 days | | |
| | | UP-Cyde 2.5EC | 245-285 mL/ha | 12 hrs | 2 days | | |
| | 5 | Delegate | 315-420 g/ha | When dry | 12 hrs | 1 day | Maximum of three applications per year with a minimum re-treatment interval of 7 days. Applications should be based on the presence of adult pests (flies) as determined by local monitoring. Consult provincial guidelines and local extension specialists for monitoring protocols and treatment thresholds. |
| | | Entrust SC | 334-440 mL/ha | | 1 day | | |
| | | Success | 165-220 mL/ha | | | | |
| | 28 | Exirel | 1.0-1.5 L/ha | 12 hrs | 12 hrs | 1 day | Begin applications when populations are low. Targets the adult life stage of SWD. If populations are high, use a registered insecticide with a different mode of action to reduce the pest populations. See label for tank-mix restrictions. Maximum 4 applications per season. |
| | | Harvanta 50SL | 1.2-1.6 L/ha | 12 hrs | 12 hrs | 1 day | Spray volumes of 200-1,400 L water per hectare are recommended. Use high rate for increased pest pressure. Apply by ground application only. Avoid using two group 28 products more than two times during a single generation of insect pest on the crop; and within a 30-day period. |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|---------------------------|-----------------------------------|----------------------------------|--|---|--------------|--|
| POST-HARVEST | | | | | | |
| Spur Blight / Anthracnose | 11+27 | Tanos 50 DF | 840 g/ha | 9 days | 9 days | Apply to foliage and fruit and repeat on a 7-day interval. Maximum 6 applications per year. Apply in sufficient water volume to ensure thorough coverage (250-800 L/ha). |
| Anthracnose | 7+11 | Pristine WG | 1.3-1.6 kg/ha | 24 hrs | 0 days | Begin applications prior to disease development and continue on a 7–14-day schedule. Use a shorter interval and/or higher rates when disease pressure is high. Maximum 4 applications per season. |
| Two-spotted Spider Mite | 6 | Agri-Mek 1.9% EC | 1 L/ha | 3 days | Post-harvest | Apply as post-harvest treatments to the bushes after the fruit are harvested. Apply first application when mites appear and second application after 7-10 days interval. Maximum two post-harvest applications per year. |
| | | Agri-Mek SC | 225 mL/ha 0.1-0.5% v/v non-ionic surfactant | 12 hrs general, 3 days hand-set irrigation | | |
| | 20B | Kanemite 15SC | 2.07 L/ha | 12 hrs | 1 day | Apply as a full coverage spray to the foliage to drip. Application should be made as soon as the mite population reaches economic infestation levels. Allow a minimum of 21 days between applications. |
| | 20D | Acramite 50WS | 851 g/ha in minimum 500 L/ha water | 12 hrs | 1 day | Maximum 1 application per year. Primarily effective on motile stages of mites. |
| | 21 | Nexter | 600 g/ha | 24 hrs | Post-harvest | Apply after harvest when mites appear. |
| | NC | Purespray Green Spray Oil 13E | 10 L in 1000 L water | 12 hrs | - | Begin when mites appear. Apply at 7–14-day intervals. Do not apply more than 8 summer spray applications per growing season. |
| Aphids | Same as Pre-harvest period | | | | | |
| Leafhoppers | Same as Pre-harvest period | | | | | |

| Insect / Disease | Group | Product ¹ | Rate / ha | REI | PHI | Note |
|------------------|-------|----------------------|-----------------------------|--------|--------|---|
| Caneborers | 4 | Alias 240 SC | 467 mL/ha in 300 L/ha water | 24 hrs | 4 days | Suppression only. Maximum two applications of products from Group 4/4A per season. |
| | 4A | Admire Flowable | 467 mL/ha in 300 L/ha water | 12 hrs | | |
| | 28 | Altacor | 215-285 g/ha | 12 hrs | 3 days | Apply soon after damage first appears. |

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

² Unless otherwise stated, use at least 2000 L water per hectare

Occasional Pests

| Insect / Disease | Note |
|------------------------------|--|
| DISEASES | |
| 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 | <p>This disease is seldom a problem. Senator 70WP 1.1 kg/ha may provide some control.</p> <p>Nova 40W – Apply at first sign of disease at a rate of 340 g/ha. Do not apply more than 340 g/ha per season. PHI: 6 day.; There is an 8 day REI for hand setting of irrigation line and a 6 day REI for harvesting, training, and tying. 12 hours REI for all other activities.</p> <p>Purespray Green Spray Oil 13E. Apply 10 L in 1000 L water (1% solution) otherwise phytotoxicity may result. Use sufficient spray volume (up to 1000 L/ha) to ensure thorough crop coverage. Begin when conditions are favourable for disease development and/or when first symptoms appear. Apply at 7 – 14 day intervals. Do not apply more than 8 summer spray applications per growing season.</p> <p>Property 300 SC – Apply 90-110 g a.i./ha. Normal spray volumes range from 200 to 1000 litres per hectare for dilute ground sprays. Begin fungicide applications preventatively and continue as needed. Use the low rate and long interval as disease preventative sprays or when the disease conditions are low. Increase to highest rate and shortest interval under moderate to heavy disease pressure.</p> |
| Phytophthora Root Rot | <p>Ridomil Gold 480EC - On <u>established plantings</u>, apply 37 mL per 100 m of row to the soil surface in a one-meter wide band centered over the row (do not apply in the spring). Apply one application prior to freeze-up (no later than November 30). On <u>new plantings</u>, apply in the spring after planting and again in the fall using the above rate. Do not apply later than November 30. Time applications prior to rain or irrigation.</p> <p>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. Consider using raised rows. PHI: 60 days.</p> <p>Phostrol – Apply at a rate of 5.2 L/ha in new plantings when plants produce new growth of 1-3 inches. Continue on a 45-60 day interval. In fall shorten interval to 21-28 days. Apply in 400L of water/ha. Maximum of 4 applications per season. PHI: 1 day. REI: 12 hours.</p> <p>Torrent 400SC - 0.25 L in up to 1000 liters of water/ha. Make one application of the fungicide solution in the fall and one application in the spring as a soil drench. Do not use any surfactant with this drench application. PHI: 90 days.</p> <p>Orondis Or Zorvec-Enicade – 1.4-2.8 L/ha. Directly apply to soil with a banded drench application at a minimum of 200L/ha, continue on a 7-14 day interval. Follow by sprinkler or drip irrigation within 24 hours to adequately distribute the product to the root zone. See specific soil application directions on the label. Use higher rate and shorter interval when disease pressure is high. Use 1-2 applications at 7-14 days apart made in spring and 1-2 applications at 7-14 days apart made in fall. REI: 12 hours, PHI: 1 day.</p> |

| Insect / Disease | Note |
|---|---|
| Phytophthora Root Rot (<i>cont.</i>) | Zorvec Epicaltrin- 07-1.4 L/ha. Directly apply to soil with a banded drench application at a minimum of 200L/ha, continue on a 7-14 day interval. Follow by sprinkler or drip irrigation within 24 hours to adequately distribute the product to the root zone. See specific soil application directions in the label. REI: 12 hours. PHI: 1 day. |
| Cane Blight | Lime Sulphur: Apply 26L/1000L water/ha to ensure thorough coverage to point of near drip. Do not use later than ¼ inch green tip. Do not spray on wet foliage. |
| 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. 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. Maximum of 6 applications per year. |

| Insect / Disease | Note |
|-----------------------------------|--|
| INSECTS* | |
| Raspberry Cane Borer | 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. Note: Altacor registration for cane and crown borer listed in post bloom timing above. |
| Raspberry Crown Borer | Remove wild brambles from the area. Apply Altacor 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. Maximum of 3 applications per season. Maximum of 645g/ha per season. Do not apply more than once every 14 days. PHI: 3 days |
| 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). Actara 25WG: Apply at 210-280 g/ha. Maximum 2 applications per season. Apply as a foliar application by broadcast spray before pests reach damaging levels. Scout fields and treat again if populations rebuild to potentially damaging levels. PHI: 3 days. |
| 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. Sanitation practices, such as removing and burning cane debris, will help. This pest is of particular concern in Newfoundland and is known to occur in NB. Nova Scotia is in the distribution zone so producers should be on the lookout for it. |
| Brown marmorated stink bug | At the time of publication there were no products registered for the control of brown marmorated stink bug in raspberries. |
| Leafhoppers | Potato leafhoppers do not overwinter in Nova Scotia. Surround WP – Apply at 12.5-25 kg/ha. Apply in 500L water at 7-14 day intervals once initial infestation is detected. Use high rate for early applications. Do not exceed 25kg/ha/application. Aster leafhoppers only. |
| Oblique-banded Leafroller | Capture: Apply at a rate of 467 ml/ha. Sequential applications must be at least 30 days apart. REI: 12 hrs PHI: 3 days Delegate: Apply to eggs and small larvae at 200 g/ha. REI: 12 hrs PHI: 1 day Entrust: Apply to eggs and small larvae at 267-364 ml/ha. REI: when dry PHI: 1 day Success: Apply to eggs and small larvae at 145-182 ml/ha. REI: when dry PHI: 1 day Bioprotec CAF: 1.4-2.8 L/ha Dipel 2X DF: 525-1125 g/ha Foray 48 BA: 1.4-2.8 L/ha. Products must be consumed to be effective. Spray when and where pests are actively feeding. Make 2 applications 3-7 days apart, when larvae are very small. Death of insect may take several days. Acidify spray mix to below pH 7.0 and apply on cloudy days or in the evening. REI: 12 hrs PHI: 1 day Intrepid: Apply at a rate of 500-750 ml/ha. Sequential applications must be at least 30 days apart. REI: 12 hrs PHI: 3 days |

-* 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 to potential problems and new pest species.

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.

v.2003.05.12