

TREE FRUITS

(Apple, apricot, cherry, nectarine, peach, pear, prune/plum)

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The control products recommended in this section are for application in **commercial orchards**. The application rates are expressed per hectare (ha) and per acre as listed on recommended product labels or derived from dilute rates listed on recommended product labels. The rates are for application by air-assisted orchard sprayers to trees greater than 4.5 m high. To assist with pesticide resistance management, the chemical class Group Number is listed with each recommended product as well as compiled in a table at the end of this section.

Pyrethroids registered for use on tree fruits are not recommended due to their adverse impact on beneficial insects and mites that provide biological control of many of the pest groups listed in this section. Avoid applying more than two applications per season of control products in Group 4 (neonicotinoids) Assail, Calypso etc. to minimize the risk of increased mite populations.

Consult with local pest management advisors for product availability, proper timing of treatment(s) and compatibility with local integrated pest management programs. Unmanaged and wild trees should be removed where possible to eliminate uncontrolled pest population development and movement into nearby orchards. **Always consult product labels before application to confirm target pests, crops, application rates and timing, buffer zones, re-entry intervals and pre-harvest intervals. It is also important that sprayers be properly maintained, calibrated and operated to ensure optimum performance of the products. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for information on pests, monitoring and the most current product registrations and updates.**

APHIDS

Aphids: Apple grain (*Rhopalosiphum fitchii*), Black cherry (*Myzus cerasi*), Green apple (*Aphis pomi*), Green peach (*Myzus persicae*), Mealy plum (*Hyalopterus pruni*), Rosy apple (*Dysaphis plantaginea*) and Woolly apple aphids (*Eriosoma lanigerum*)

Biological Control

Preservation of aphid predators and parasites can maintain aphid numbers below damaging levels. Use control products that are least harmful to predators and parasites. Some species of predators are commercially available for release.

Cultural Control

Avoiding excessive nitrogen application will limit aphid populations by reducing succulent growth that is attractive to aphids.

Chemical control

Inspect trees at dormant for aphid eggs and in the spring for aphids. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications /season	Preharvest Interval (days)
Assail 70 WP (4)	apple, pear	80 – 120 g	32 – 48 g	2	7
Beleaf (29)	all fruit	160 g (pome) 200 g (stone)	65 g (pome) 81 g (stone)	3	21 (pome) 14 (stone)
Closer (4C)	all fruit	400 mL (woolly apple aphid) 100 – 200 mL (all other aphids)	162 mL (woolly apple aphid), 40 – 80 mL (all other aphids)	2	7
Cormoran (4 + 15)	apple	700 – 1050 ml	283 – 425 ml	6.9 L/ha	14
Exirel (28)	all fruit	750 – 1500 mL	304 – 607 mL	4	3
Imidan 50 WP (1B)	apple	3.75 kg	1.5 kg		14
Movento 240 SC (23)	all fruit	365 – 435 mL	148 – 176 mL	4 (pome) 2 (stone)	7
Sivanto Prime (4D)	all fruit	500 – 750 mL	202 – 304 mL	2000 mL/ha	14
Suffoil-X (NC)	all fruit	13 L/1000 L of water/ha		8	0
Vayego (28)	all fruit	150 mL	61 mL	2	7
Versys (9D)	all fruit	1000 mL	404 mL	2	7

Precautions

Assail: Do not apply more than 2 times/year to avoid possible mite build-up. Ready to use (RTU) product is available for non-commercial trees.

Beleaf: Do not apply more than 3 times/season.

Closer: Allow 7 days between applications.

Cormoran: Do not apply at intervals of less than 12 days.

Exirel: Allow 7 days between applications.

Malathion: For best results, apply when temperature is above 20°C.

Movento: Do not apply at intervals of less than 14 days.

Sivanto Prime: Not registered for woolly apple aphid control. Allow 10 days between applications.

Suffoil-X: Allow 10 – 14 days between applications. Do not apply within 14 days before or after captan fungicide.

Vayego: Toxic to bees. Apply post-bloom only.

Versys: Allow 7 days between applications.

APPLE CLEARWING MOTH (*Synanthedon myopaeformis*)

Behavioural Control (for use under low pest pressure)

Apply Isomate-P pheromone dispensers prior to moth emergence by suspending the dispensers about the midpoint of the tree canopy. Refer to the label instructions and precautions to ensure optimal performance of this product.

Active Ingredient	Crop	Rate (dispensers/ha)	Rate (dispensers/acre)	Preharvest Interval (days)
(Z,Z)-3,13 Octadecadien-1-yl Acetate plus (E,Z)-3,13 Octadecadien-1-yl Acetate	apple	250 – 625	100 – 253	0

Mass trapping

Trap moths with buckets baited with grape juice. Remove moths weekly and top up grape juice.

Biological control

Earwigs, ants, spiders, and birds will feed on larvae. Birds will however, cause damage to the bark of trees during feeding and this may kill trees.

Cultural Control

Reduce the risk of infestations by minimizing wounds to trees, remove young trees with cankers, and seal wounds with wound-protecting products. Do not import host root stocks or trees from infested areas.

Chemical Control

Look for frass development and larvae in the spring. Use pheromone traps to monitor moths to aid in proper timing of sprays. Apply products to lower trunks with a hand-gun sprayer. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum number of applications/season	Preharvest Interval (days)
Altacor (28)	apple	285 g	115 g	3	5
Delegate (5)	apple	420 g	170 g	2	7
Entrust (5)	apple	364 mL	147 mL	8	7
Rimon (15)	apple	1.4 L/1000 L of water/ha		2	14
Success (5)	apple	125 mL	50 mL	7	7

Precautions

Altacor: Allow 10 – 14 days between applications.

Delegate: For suppression only. Allow 14 days between applications.

Entrust: Allow 7 – 10 days between applications.

Rimon: Allow 14 days between applications.

Success: Allow 7 – 10 days between applications.

APPLE MAGGOT (*Rhagoletis pomonella*)**Cultural Control**

Examine fruit for infestations and destroy by crushing or burial (minimum 30 cm deep).

Chemical Control

Suspending sticky ammonium carbonate-baited red spheres or yellow card traps can aid in detecting adult movement into and within orchards as well as aid in proper timing of recommended products against adults.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Altacor	apple	215 – 285 g	87 – 115 g	3	5
Ambush 500 EC (3)	apple	400 mL	162 mL	3	7
Assail 70 WP (4)	apple	120 – 240 g	48 - 97	4	7
Calypso 480 SC (4)	apple	440 mL	178 mL	875 mL/ha	30
Cormoran (4A +15)	apple	1020 – 1260 mL	412 – 510 mL	6.9 L/ha	14
Delegate WG (5)	apple, pear	420 g	170 g	3	7
Exirel (28)	apple	1500 mL	607 mL	4.5 L/ha	3
GF-120	apple	1.5L/6 L of water/ha		10	0
Harvanta 50 SL (28)	apple	1200 – 1600 mL	486 – 648 mL	3	7
Imidan 50 WP (1B)	apple	3.75 kg	1.5 kg	5	14
Mako	apple	250 mL	101 mL	3	7
Pounce 384 EC (3)	apple	520 mL	116 mL	3	7
Surround WP (NC)	apple	25 – 50 kg	10 – 20 kg		0
Twinguard (4C+5)	apple, pear	500 g	202 g	2	7
Vayego 200 SC (28)	apple	300 mL	121 mL	3	7

Precautions

Altacor: For suppression only. Allow 10 - 14 days between applications.

Ambush: Allow 14 days between applications. Toxic to bees. Do not apply during bloom.

Assail: Use the high rate under heavy pest pressure. Allow 12 days between applications.

Do not apply during bloom.

Calypto: Allow 14 – 21 days between applications if required.

Cormoran: Do not apply at intervals of less than 12 days. Do not allow Cormoran to drift on grapes as leaf spotting may occur.

Delegate: Do not apply at intervals less than 7 days.

Exirel: Apply 7-10 days after the first apple maggot fly is caught on baited traps.

Allow 10 -14 days between applications. Do not tank mix with Flint, Sovran, Pristine, copper or captan fungicides. Toxic to bees.

GF-120: For suppression only. Reapply every 7 days or earlier if rain washes off the deposit.

Harvanta: For suppression only. Do not apply at intervals less than 14 days. Toxic to bees.

Mako: Toxic to bees. Do not apply during bloom.

Pounce: Do not apply at intervals less than 14 days. Toxic to bees. Do not apply during bloom.

Twinguard: For suppression only. Do not apply at intervals less than 7 days.

Vayego: For suppression only. Reapply at 14 – 21 days if needed. Toxic to bees.

BROWN MARMORATED STINK BUG (*Halyomorpha halys*)

Monitor for the presence of adults and nymphs with pheromone-baited sticky or pyramid traps.

Biological control

The samurai wasp, *Trissolcus japonicus* that attack the eggs of brown marmorated stink bugs in Asia have been found in the United States, Europe and in British Columbia and Ontario in Canada. It continues to be released in the United States to help control brown marmorated stink bugs. Predators of brown marmorated stink bugs include spiders, ladybugs, predatory thrips, lacewings, sand wasps (*Astata occidentalis*) and red velvet mite, *Balaustium putmani*.

Chemical Control

There are currently no registered products for the control of brown marmorated stink bugs in tree fruits in Canada.

CODLING MOTH (*Cydia pomonella*)

Cultural Control

Examine fruit weekly and destroy any infested fruit by crushing or burying at least 30 cm deep. Additional control can be achieved by wrapping a 10 cm-wide strip of cardboard around the base of apple and pear trees in late June. Remove and destroy the bands by mid-July. Replace with new bands that can be removed and destroyed in the fall. Remove wood ladders, support poles, bins, large prunings and other wood debris to reduce pupation/overwintering sites. Thinning apples and pears to singles will reduce damage by reducing preferred larval feeding sites between touching fruit.

Behavioural Control (Mating Disruption) - apple, pear

Apply Isomate CM Flex (1000 dispensers/ha) or Isomate CM/LR TT (750 dispensers/ha) by suspending the dispensers in the upper third of the tree canopy. Refer to the label instructions and

precautions to ensure optimal performance of products.

Biological control

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Virosoft – CP4 (granulosis virus)	apple, pear	250 mL	100 mL	4	0
Madex HP (granulosis virus (CpGV) isolate V-22)	apple, pear	50 – 100 mL	20 – 40 mL	5	0

Precautions

Madex HP: The pH of tank solution should range from 5 - 8.5. Use the high rate under high pest pressure or when reapplication interval is longer than 6 days.

Virosoft: Virus must be ingested to be effective. Apply product in late afternoon or on a cloudy day to avoid direct exposure to sunlight. Use a spray interval of 14 days.

Chemical Control

Use pheromone-baited traps to monitor moths and determine if and when to apply treatments.

Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications /season	Preharvest Interval (days)
Altacor (28)	apple, pear	145 – 215 g	59 – 87 g	3	14
Assail 70 WP (4)	apple, pear	120 – 240 mL	48 – 97 mL	3	7
Calypso 480 SC (4)	apple	290 – 440 mL	117 – 178 mL	3	30
Cormoran (4A + 15)	apple	1050 – 1260 mL	425 – 510 mL	6.9 L/ha	14
Confirm 240 F (18)	apple, pear	1 L	404 mL	4	14
Delegate WG (5)	apple, pear	420 g	170 g	3	7
Entrust (5)	apple, pear	364 mL	147 mL	3	7
Exirel (28)	apple, pear	500 – 750 mL	202 – 304 mL	4	3
Harvanta 50 SL (28)	apple, pear	1200 – 1600 mL	485 – 647 mL	3	7
Minecto Pro (6 + 28)	apple	496 mL	201 mL	1	28
	pear	556 mL	225 mL		
Imidan 50 WP (1B)	apple, pear	3.75 kg	1.5 Kg	5	14
Intrepid 240 F (18)	apple	1.0 L	404 mL	2 L/ha	14
Pure Spray green spray oil (NC)	apple, pear	10 L	4 L		0

Rimon 10 EC (15)	apple	0.65 – 1.4 L	246 – 567 mL	4	14
Vayego 200 SC (28)	apple, pear	225 mL	91 mL	3	7

Under no-rainfall conditions, Calypso and Confirm provide about 2 – 3 weeks protection from codling moth damage; Assail, Delegate, Intrepid, Imidan, Rimon, Exirel, and Harvanta about 10 – 14 days protection.

Precautions

Altacor: Do not apply more than once every 10 days.

Assail: Do not apply more than once every 12 days.

Calypso: Use high rate against second generation.

Confirm: Repeat application 14-21 days later if indicated by adult monitoring. Do not use if codling moth population is resistant to organophosphate (group 1B) insecticides.

Cormoran: Do not apply more than once every 12 days.

Delegate: Do not apply at intervals less than 7 days.

Entrust: For suppression only. Use a spray interval of 7 – 10 days. Approved for organic production.

Exirel: Do not tank mix with Flint, Sovran, Pristine, copper or captan fungicides. Toxic to bees.

Repeat 10 to 14 days later if indicated by adult monitoring.

Harvanta: Toxic to bees. Use an application interval of 14 days if needed.

Intrepid: Do not use if codling moth population is resistant to organophosphate (group 1B) insecticides.

Minecto Pro: Add 0.25 – 1% spray oil/ spray mixture.

Pure spray green spray oil: Apply at or just before egg laying. Apply every 7-14 days depending on pest pressure. Do not use in combination with or within 14 days of sulphur or captan.

Rimon: Repeat treatments at 10 – 14 days intervals as indicated by monitoring.

Vayego: Apply post-bloom only. Repeat application 10 to 14 days later if indicated by adult monitoring.

Visit the OKSIR Program web site (www.OKSIR.org) for more information about codling moth control.

EYESPOTTED BUD MOTH (*Spilonota ocellana*)

Chemical Control

Pheromone-baited traps are available to monitor the presence of adults but do not indicate potential for crop damage. Many of the products recommended for control of leafrollers will also control any bud moth larvae present. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Altacor (28)	pome fruits	145 – 285 g	59 – 115 g	3	5
Delegate (5)	pome fruits	210 – 420 g	85 – 170 g	3	7
Entrust (5) (approved for organic production)	all fruit	364 mL	147 mL	3	7 (apple, pear) 3 (cherry, apricot, plum, prune) 1 (peach, nectarine)
Exirel (28)	pome fruits	500 – 1000 mL	202 – 404 mL	4	3
Minecto Pro (6 + 28)	apple	496 mL	201 mL	1	28
	pear	496 – 741 mL	201 – 300 mL	1.0 L/ha	28
Success (5)	all fruit	182 mL	74 mL	3	7 (apple, pear) 3 (cherry, apricot, plum, prune) 1 (peach, nectarine)

Precautions

Altacor: Apply at pink to petal fall when larvae are active. Reapply at 10 – 14 days if needed.

Delegate: Apply when larvae begin to actively feed, green tip to calyx. Repeat application in 14 days if required. Use higher rate under high pest pressure and or large larvae.

Exirel: Apply when larvae are active. Reapply in 10 – 14 days as required. Do not tank mix with Sovran, Flint, Pristine, Copper or Captan fungicides. Toxic to bees.

Entrust: If 3 applications are made for cherries, the first may be made up to 28 days before harvest, the second up to 10 days before harvest and the final application at 3 days before harvest. Allow 7 days between applications for other stone and pome fruits.

Minecto Pro: Add 0.25 – 1% spray oil/ spray mixture.

Success: If 3 applications are made for cherries, the first may be made up to 28 days before harvest, the second up to 10 days before harvest and the final application at 3 days before harvest. Allow 7 days between applications for other stone and pome fruits.

FRUIT FLIES

Fruit Flies: Western cherry (*Rhagoletis indifferens*) and Black cherry (*Rhagoletis fausta*) fruit flies

Chemical Control

Yellow sticky traps or delta traps baited with ammonium carbonate suspended in trees will aid in detecting adult flies. Apply control products within 6 days of first capture. Apply a post-harvest

spray to prevent infestation of unharvested fruit. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Assail (4)	cherry	240 g	97 g	2	7
Cormoran (4 + 15)	cherry	2100 mL	850 mL	6.9 L/ha	7
Cygon 480 - AG Lagon 480 E (1B)	cherry	2.25 L	910 mL	2	21
Delegate (5)	cherry	420 g	170 g	3	5
*Entrust (5)	cherry	364 mL	147 mL	4	7
Exirel (28)	cherry	750 – 1500 mL	304 – 607 mL	4	3
*GF-120 Bait Spray (5)	cherry	1.0 – 1.5 L	405 – 607 mL	10	0
Harvanta (28)	cherry	1200 – 1600 mL	485 – 647 mL	3	7

*Entrust and GF-120 are approved for organic production.

Precautions

Wettable powders may leave unsightly residue on fruit. EC formulations may burn leaves, especially when applied under full sun.

Assail: For suppression only.

Cygon, Lagon: May cause leaf burning and premature leaf drop of Lapin, Stella and Sam varieties of cherries. Toxic to bees. Do not apply during bloom or 5 days before bloom.

Cormoran: Allow 10 days between applications. Toxic to bees, do not apply during bloom.

Delegate: For suppression only. Apply within 5 days of first fly capture. Allow 7 days between applications.

Entrust: Allow 5 – 7 days between applications. Shorten the application interval during rainy periods and fruit ripening stage. Entrust is approved for application to cherries grown under organic certification.

Exirel: Allow 7 days between applications. Do not tank mix with Sovran, Flint, Pristine, Copper or Captan fungicides. Toxic to bees.

GF-120: Reapply every 7 days. Shorten the application interval during rainy periods and fruit ripening stage. GF-120 is approved for application to cherries grown under organic certification. Do not use an air-assisted sprayer to apply GF-120. Consult local crop advisors for information on obtaining a sprayer designed to apply GF-120 as per label instructions.

Harvanta: Allow 7 days between applications. Toxic to bees. Do not apply during bloom.

FRUITWORMS

Fruitworms: Brown (*Eupsilia tristigmata*), Cherry fruitworm (*Grapholita packardii*), Green (*Lithophane antennata*) and Speckled (*Orthosia hibisci*) fruitworms (check product label for listed species).

Biological Control

Trade name	Crop	Rate (/ha)	Rate (/acre)	Preharvest Interval (days)
Dipel 2X DF (11)	all fruit	1125 – 1675 g	455 – 678 g	0
Bioprotec CAE (11)	all fruit	2.8 – 4.0 L	1.13 – 1.62 L	
Bioprotec PLUS (11)	all fruit	1.8 – 2.5 L	0.73 – 1.0 L	

Chemical Control

Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Preharvest Interval (days)
Altacor (28)	apple, pear	145 – 215 g	59 – 87 g	5
Cormoran (4 + 15)	apple	1050 mL	425 mL	14

Precautions

Altacor: Do not apply more than 3 times/season. Allow 10 - 14 days between applications.

Cormoran: Do not apply more than 6.9 L/ha /season. Allow 12 days between applications if needed.

Dipel, Bioprotec, Bioprotec PLUS: Apply under cloudy conditions or later in the day to minimize exposure to UV radiation and extend residual activity. Allow 7 days between applications if required.

LEAFROLLERS

Leafrollers: European (*Archips rosana*), Fruittree (*Archips argyrospila*), Obliquebanded (*Choristoneura rosaceana*) and Threelined (*Pandemis limitata*) leafrollers (check label for listed species)

Behavioural Control

Apply Isomate CM/LT TT pheromone dispensers at a rate of 750/ha on lateral branches in the upper 0.7 – 1 metre of tree canopy just prior to the start of moth flight. Refer to the product label for additional instructions to optimize performance.

Biological Control

Several species of predatory and parasitic insects, spiders and birds feed on all stages of leafrollers. Dipel 2X DF, Bioprotec CAE, Bioprotec PLUS (*Bacillus thuringiensis* (Bt)) products do not disrupt biological control. They are most effective when applied against 3rd - 4th instar larvae, under conditions of lower UV radiation (late afternoon, cloudy days), and without the threat of rainfall within 24 hours of application.

Trade Name	Crop	Rate (/ha)	Rate (/acre)	Preharvest Interval (days)
Dipel 2X DF (11)	all fruit	1.13 – 1.67 kg	0.46 – 0.68 kg	0
BioProtec CAF (11)	all fruit	2.8 – 4.0 L	1.1 – 1.6 L	
Bioprotec Plus (11)	all fruit	1.8 – 2.5 L	0.73 – 1.0 L	

Cultural Control

Winter pruning will remove many overwintering European and fruittree leafroller egg masses. Thinning apples and pears to singles will reduce damage by reducing larval feeding sites between touching fruit.

Chemical Control

Apply local adult and larval monitoring methods and pest development models to determine if and when control products should be applied. Read and follow label directions. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Altacor (28) (obliquebanded and threelined only)	all fruit	145 – 285 g	59 – 115 g	645 g/ha	5 (apple, pear) 1 (stone fruit)
Confirm 240 F (18) (obliquebanded and threelined only)	apple, pear	1.0 L	404 mL	4	14
Delegate WG (5) (obliquebanded and threelined only)	all fruit	210 – 420 g	85 – 170 g	3	7 (apple, pear) 5 (cherry) 3 (plum, prune, apricot) 1 (peach, nectarine)
Entrust (5)	all fruit	364 mL	147 mL	3	7 (apple, pear) 3 (cherry, plum, prune, apricot) 1 (peach, nectarine)

Exirel (28)	all fruit	500 – 1000 mL	202 – 404 mL	4	3
Harvanta (28) (obliquebanded and threelined)	all fruit	1.2 – 1.6 L	485 – 647 mL	3	7
Intrepid 240 F (18) (obliquebanded and threelined only)	apple	750 mL	304 mL	2 L	14
Imidan 50 WP (1B) (obliquebanded only)	apple, pear	3.75 kg	1.5 kg	5 (apple, pear) 4 (peach)	14
Minecto Pro (6 + 28)	apple, pear	496 mL	201 mL	1	28
Success (5)	apple, pear	182 mL	74 mL	3	7 (apple, pear) 3 (cherry, plum, prune, apricot) 1 (peach, nectarine)
Vayego (28) (obliquebanded only)	all fruit	225 mL	91 mL	3	7 (pome fruit) 5 (stone fruit)

Precautions

Altacor: Do not apply more than once every 7 (stone fruit) or 10 days (pome fruit).

Confirm: For suppression of summer-generation obliquebanded (OBLR) and threelined leafroller larvae, apply at egg hatch and repeat 10 – 14 days later if required. For control of overwintering generation, apply at petal fall. Cross-resistance with organophosphate-resistant OBLR and fruittree leafroller has been documented in Canada.

Delegate: Use the higher rate for high pest pressure and/or larger larvae. If 3 applications are made for cherries, the first may be made up to 30 days before harvest, the second up to 12 days before harvest and the final application at 5 days before harvest. Allow 7 days between applications for other stone and pome fruits.

Dipel, Foray, Bioprotec: Apply Bt products at pink and petal fall (for heavy populations) during late afternoon or on a cloudy day when there is no risk of rain for 24 hours. If there is more than 2 mm of rainfall within 24 hours of application, repeat the treatment.

Wait 7 days (in the absence of rainfall) before applying a second treatment of Bt or other product if active larvae are still present. Optimum pH for Bt products is 6.

Entrust: Allow 7 days between applications on pome fruits. If 3 applications are made for cherries, the first may be made up to 28 days before harvest, the second up to 10 days before harvest and the final application at 3 days before harvest. Allow 7 – 10 days between applications for other stone fruits.

Exirel: For overwintering generation, apply at petal fall when larvae are active and for summer generation, apply at egg hatch. Reapply 10 days later if required. Do not tank mix with Flint, Pristine, Cabrio, copper and captan fungicides. Toxic to bees.

Harvanta: Apply when overwintering larvae become active and at or just before egg hatch for summer generation. Reapply in 14 and 7 days for pome and stone fruits respectively, if required. Toxic to bees. Do not apply during bloom.

Imidan: For oblique banded leafroller, begin application 7 – 10 days after first moths are caught in traps.

Intrepid: For suppression of summer-generation obliquebanded and threelined leafroller larvae, apply at egg hatch and repeat 14 – 21 days later if required. For control of overwintering generation, apply at petal fall. Cross-resistance with organophosphate-resistant OBLR

and Fruittree leafroller has been documented in Canada.

Minecto Pro: For overwintering generation, apply at petal fall when larvae are active and apply at egg hatch for summer generation. Add 0.25 – 1% spray oil/ spray mixture. Toxic to bees. Do not apply during bloom.

Success: Allow 7 – 10 days between applications. If 3 applications are made for cherries, the first may be made up to 28 days before harvest, the second up to 10 days before harvest and the final application at 3 days before harvest.

Vayego: Monitor adult flight and apply at first egg hatch. Reapply 10 – 14 days if required. Toxic to bees. Do not apply during bloom. Apply post-bloom only.

LYGUS BUGS (*Lygus* spp.)

Chemical Control

Monitor orchard margins for immigrating adults and apply control products accordingly. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Beleaf (29)	all fruit	200 g	81 g	3	21 (pome) 14 (stone)
Closer (4C)	pome fruits	300 mL	121 mL	2	7
Cormoran (4A + 15)	apple	1260 mL	510 mL	2	14
Cygon 480-AG, Lagon 480E (1B)	pear	625 mL/1000 L of water		2	28
Imidan 50 WP (1B)	apple, peach	3.75 kg	1.5 kg	5 (apple) 4 (peach)	14

Precautions

Beleaf: For suppression only. Allow 7 days between applications if required.

Closer: Reapply in 7 days if required.

Cormoran: Do not make applications less than 12 days apart. Do not allow Cormoran to drift onto grapes as leaf spotting may occur.

Cygon: Apply at pre-bloom. Allow 10 days between applications. Toxic to bees. Do not apply during bloom or during the 5-day period before bloom.

MITES

Mites: European red (*Panonychus ulmi*), McDaniel spider (*Tetranychus mcdanieli*) and Twospotted spider (*Tetranychus urticae*) mites

Biological Control

Preservation of predaceous insects and mites provides satisfactory control of harmful mites. Use control products least harmful to these predators. Predatory mites are at risk if lime-sulphur, pyrethroids and other chemicals harmful to these mites are applied when present. Neonicotinoid products (Calypso, Assail) may cause increased mite populations if used against successive generations. It is recommended that not more than two applications of these Group 4 insecticides be applied per season.

Chemical Control

Alternate products with different Group Numbers to avoid development of resistance. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (ha)	Rate (acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Acramite 50 WS (20D)	apple	568 g (spider mites)	230 g (spider mites)	1	7
		851 g (red mite)	345 g (red mite)		
Agri-Mek SC (6)	apple	170 mL	69 mL	2	28
	pear	170 – 340 mL	69 – 138 mL	1	
Apollo SC (10)	apple, pear, peach, nectarine	300 mL	121 mL	1	21
Guardman Dormant oil (NC) (European red mite only)	pome and stone fruit	90 L	36 L	1	n/a
Envidor 240 SC (23)	pome and stone fruit	750 mL	304 mL	1	7
Kanemite 15 SC (20B)	apple, pear	2.1 L	850 mL	2	14
Nealta (25)	stone fruit	1 L	405 mL	2	7
Nexter 75 WP (21)	apple, pear, cherry, *peach,	300 – 600 g	121 – 242 g	2 (apple, pear), 1 (cherry, peach),	25 (apple, pear), 7 (cherry)

	*nectarine (*Ontario only)			nectarine)	14 (peach, nectarine)
Magister SC (21 + 39)	pome and stone fruits	1.75 – 2.34 L (spider mites, red mites)	700 – 900 mL		10
	apple, pear	1.75 L (rust mites)	700 mL		10
Minecto Pro (6 + 28)	apple, pear	496 mL	201 mL		28
Pure Spray green spray oil (NC) (European red mite only)	all fruit	20 L/1000 L of water (dormant)		2 (dormant)	
		10 L (summer)	4 L (summer)		10 L (summer)
Suffoil-X (NC)	all fruit	13 L/1000 L of water		8	
Superior 70 oil (NC) (European red mite only)	all fruit (except sweet cherry)	60 L	24 L		n/a

Pre-bloom treatments

Dormant oil: Use alone or in combination with lime-sulphur for dormant control of mite eggs. Check labels for rates and mixing instructions.

Precautions

Acramite: For effective control, apply as soon as mites appear.

Agri-Mek: Must be applied in a minimum of 0.25% oil. Apply before a threshold of 5 spider mites/leaf is reached. Reapply to pear in 21 days if required. Some suppression of predatory mite may occur.

Apollo: Do not apply to apple beyond 14 days after petal fall.

Dormant oil: apply at dormant stage.

Envidor: Apply post-bloom only.

Kanemite: Do not apply at intervals less than 21 days. Does not control rust mites.

Magister: Toxic to bees. Avoid application during bloom.

Minecto Pro: Apply before a threshold of five spider mites per leaf is reached. Add 0.25 – 1% spray oil/ spray mixture.

Nealta: Do not apply at intervals of less than 14 days. Controls all life stages. Not for rust mite control.

Nexter: Do not apply at intervals of less than 30 days on apple and pear. Higher rates can cause some suppression of predatory mites.

Purespray green spray oil: For dormant sprays, apply at dormant to pre-bloom. Do not apply prior to or during freezing temperatures or rain. Summer sprays are for suppression only. Begin applications when mites first appear. Allow 10 – 14 days between applications. Do not use within 14 days before or after captan or sulphur. Test for crop tolerance before widespread use. Maximum of two dormant applications, if summer spray applications are expected during the growing season.

Suffoil-X: For suppression only. Test for crop tolerance before widespread use. Apply every 10 – 14 days, depending on level of pest pressure. Do not apply to trees lacking moisture. Do not use within 14 days before or after Captan fungicide.

Superior 70 oil: Apply dormant to pre-bloom. Do not apply just prior to or during freezing

temperatures or rain. May cause bark damage on Red Delicious.

MULLEIN BUG (*Campylomma verbasci*)

Cultural

Removal of mullein in and around orchards may be helpful. Avoid large plantings of corn or potatoes near orchards.

Chemical Control

The fruit of susceptible apple varieties greater than 12 mm in diameter is not affected by Mullein bug feeding. Applying products as early as possible in petal-fall stage without risk to foraging honey bees improves fruit protection. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Assail 70 WP (4)	apple, pear	80 – 160 g	32 – 64 g	1	7
Calypso 480 SC (4)	apple	145 – 290 mL	59 – 117 mL	1	30
Closer (4C)	apple, pear	400 mL	162 mL	2	7
Cormoran (4 + 15)	apple, pear	840 – 1260 mL	340 – 510 mL	6.9 L/ha	14
Vayego (28) (suppression)	apple, pear	300 mL	121 mL	3	7

Precautions

Assail: Apply after pollination is complete and bees are no longer foraging in the orchard. Use high rate under heavy pest pressure. Do not apply more than 2 times/year for all uses to prevent mite problems. Fruit greater than 12 mm diameter are not affected by campylomma feeding.

Calypso: Apply when nymphs have reached economic thresholds.

Closer: Do not apply during bloom or when flowering weeds are present. Reapply in 7 days if required.

Cormoran: Reapply in 12 days if needed.

Vayego: For suppression only. Apply at petal fall when nymphs have reached economic threshold. Reapply in 7 – 14 days if required. Toxic to bees. Apply post-bloom only.

PEACH TREE BORER (*Synanthedon exitiosa*)

Behavioural Control

Apply Isomate-P pheromone dispensers prior to moth emergence by suspending the dispensers

about the mid-point of the tree canopy. Refer to the label instructions and precautions to ensure optimal performance of this product.

Trade name	Crop	Rate (dispensers/ha)	Rate (dispensers/acre)	Preharvest Interval (days)
Isomate-P pheromone	Peach, nectarine, cherry, prune, plum, apricot	250 – 625	100 – 253	0

Cultural Control

Destroy larvae by probing larval tunnels with flexible wire or open tunnels and destroy larvae. Place 25-30 cm high metal or cardboard conical collar over base of tree and seal top and bottom to prevent larvae from penetrating crown area.

Chemical Control

Use pheromone-baited traps to monitor moths and determine if and when tree trunks should be treated. Use a hand-gun sprayer to ensure adequate coverage. Cover the tree trunk and scaffold limbs, particularly the graft union and any pruning cuts. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/ac)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Altacor (28)	stone fruit	215 – 285 g	87 – 115 g	3	1
Delegate (5) (suppression)	stone fruit	420 g	170 g	3	1
Rimon (15)	stone fruit	1.4 L/1000 L of water		3	14

Precautions

Altacor: Monitor adults with pheromone traps and apply within 7 days of first trap catch of adult male moths. Do not apply more than once every 10 days.

Delegate: For suppression only. Apply within 7 – 10 days of first trap catch of male moths in pheromone traps. Repeat applications at 14 – 21 days intervals.

Rimon: Apply at 21 days intervals starting 7 – 10 days after first pheromone trap catch.

PEACH TWIG BORER (*Anarsia lineatella*)

Chemical Control

Use pheromone-baited traps to monitor moths and determine if and when treatments should be applied. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Altacor (28)	stone fruit	215 – 285 g	87 – 115 g	645 g/ha	1
Entrust (5) (suppression)	peach	364 mL	147 mL	3	14
Exirel (28)	stone fruit	750 – 1000 mL	304 – 404 mL	4	3
Harvanta (28)	stone fruit	1.2 – 1.6 L	485 – 647 mL	3	7
Imidan 50 WP (1B)	peach	2.68 kg	1.1 kg	4	14
Rimon (15)	stone fruit	1.35 – 3.35 L	0.55 – 1.35 L	3	14
Success (5) (suppression)	peach	182 mL	74 mL	3	14
Vayego (28)	stone fruit	225 mL	91 mL	3	5

Precautions

- Altacor: Monitor moths with pheromone traps and apply within 7 days of first trap catch of adult male moths. Do not apply more than once every 7 days.
- Entrust: For overwintering generations apply when larvae become active in the spring, from early petal fall to husk fall. For summer generations, apply at first egg hatch. Reapply in 7 – 10 days if required. Do not apply when bees are actively foraging.
- Exirel: Monitor adults with pheromone traps and apply within 7 days of first trap catch. Do not apply more than once every 7 days. Do not tank mix with Flint, Pristine, Cabrio, copper or captan. Toxic to bees.
- Harvanta: Use higher rate for heavy infestations and overwintering generations. For summer generations, apply during peak egg laying periods. Do not apply more than once every 7 days. Toxic to bees. Do not apply during bloom.
- Rimon: Apply with 38-56 L oil/ha at dormant/delayed dormant. Use high rates if orchard has a history of heavy populations. Reapply in 10 to 14 days.
- Success: For over-wintering generations apply when larvae become active in the spring, from early petal fall to husk fall. For summer generations, apply at first egg hatch. Reapply in 7 – 10 days if required. Do not apply when bees are actively foraging.
- Vayego: Apply at first egg hatch, reapply in 10 – 14 days if required. Toxic to bees. Apply post-bloom only.

PEAR PSYLLA (*Cacopsylla pyricola*)

Biological Control

A number of predaceous insects (*Campylomma verbasci*, *Deraeocoris brevis*, pirate bugs, and lacewings) can effectively keep pear psylla below damaging levels if harmful sprays are avoided. Isomate-C Plus or Isomate CM/LR TT are not disruptive to beneficial insects. Apply Imidan, *Bacillus thuringiensis* products or Success/Entrust for control of fruitworms, leafrollers and bud moth in the spring and summer. Summer pruning to remove new shoots will eliminate favoured egg laying and feeding sites.

Chemical Control

Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ number of applications/ season	Preharvest Interval (days)
Agri-Mek 1.9 EC (6)	pear	170 – 340 mL	69 – 138mL	2 (170 mL/ha) 1 (340 mL/ha)	28
Assail 70 WP (4)	pear	80 – 160 g	32 – 64 g	2	7
Dormant oil (pre-bloom only)					
Guardsman	pear	90 L	36 L	1	
Superior 70	pear	60 L	24 L	1	
Purespray Green	pear	20 L/1000 L of water		1	
Insecticidal soap	pear	20 – 25 L	8 – 10 L	3	0
Magister SC (21 + 39)	pear	1.75 – 2.63 L	0.7 – 1.1 L	1	10
Minecto Pro (6 + 28)	pear	496 – 1000 mL	201 – 405 mL	1.0 L/ha (405 mL/ac)	28
Movento 240 SC (23)	pear	365 – 435 mL	148 – 176 mL	4	7
Nexter 75 W (21)	pear	600 – 720 g	243 – 291 g	2	25
Sivanto Prime (4D) (suppression)	pear	750 – 1000 mL + 0.25% oil	304 – 405 mL + 0.25% oil	2000 mL/ha (810 mL/ac)	14

Precautions

Check with local authorities for presence of resistance to organophosphate products. Alternate between products with different Group Numbers to avoid or delay resistance development.

Agri-Mek: Must be applied in a minimum of 0.25% spray oil (10 – 20 L/ha). Reapply in 21 days if required if using a rate of 170 mL/ha.

Assail: Best results are achieved against nymphs. Apply after pollination is complete and bees are no longer foraging in the orchard. Reapply in 12 days if required.

Dormant oil: Do not apply just before or during freezing weather or rain.

Insecticidal soap: Do not tank-mix with or apply within 3 days of sulphur. Use a minimum of 1900 – 2475 L of spray mixture/ha (800 – 1000 L/acre) to ensure thorough and uniform coverage.

Magister: Toxic to bees. Avoid application during bloom.

Movento: Do not apply at intervals less than 14 days.

Minecto Pro: Apply before a threshold of five spider mites per leaf is reached. Add 0.25 – 1% spray oil/ spray mixture.

Nexter: Reapply in 30 days if necessary.

Sivanto Prime: Suppression only. Addition of 0.25% oil may cause fruit injury to certain varieties of pears, particularly Anjou. Observe precautions on oil labels before using. Allow 10

PLUM CURCULIO (*Conotrachelus nenuphar*)

Chemical Control – Monitor orchard margins for immigrating adults and apply control products accordingly. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Number of applications/season	Preharvest Interval (days)
Assail 70 WP (4A)	pome stone fruits	120 – 240 g 240 g	48.6 – 97.2 g 97.2 g	2	7
Calypso 480 SC (4A)	apple	290 – 440 mL	117 – 178 mL	2	30
Cormoran (4A + 15)	apple	1050 – 1260 mL	425 – 510 mL	2	14
	stone fruits	2100 mL	850 mL	2	7
Delegate WG (5)	apple, pear	420 g	170 g	3	7
Exirel (28)	pome, stone fruits	1000 – 1500 mL	405 – 607 mL	4	3
Harvanta 50SL (28) (suppression)	pome, stone fruits	1.2 – 1.6 L	486 – 648 mL	3	7
TwinGuard (4C + 5) (suppression)	pome fruits	500 g	202 g	2	7
Vayego 200 SC (28) (suppression)	pome, stone fruits	300 mL	121 mL	3	7 (pome) 5 (stone)

Precautions:

Assail: Do not use as a border spray. Reapply at intervals of 12 days. Repeated use may cause mite outbreaks. Toxic to bees.

Calypso: Apply at petal fall. Use high rate for high pest pressure. Do not use as a border spray. Repeated use may cause mite outbreaks. Toxic to bees.

Cormoran: May provide only suppression under high pest pressure. Reapply at intervals of 12 days on apple and 10 days on stone fruits.

Delegate: Do not apply at intervals less than 7 days.

Exirel: Apply at petal fall. Reapply 10 – 14 days if needed. Do not tank mix with Flint, Pristine, Cabrio, copper or captan.

Harvanta: for suppression only. Do not apply at intervals of less than 7 days. Toxic to bees, do not apply at bloom.

TwinGuard: for suppression only. Do not apply at intervals less than 14 days. Toxic to bees, do not apply at bloom.

Vayego: For suppression only. Apply at petal fall. Reapply 7 – 14 days if required. Toxic to bees, apply post-bloom only.

RUST MITES

Apple (*Aculus schlechtendali*), Pear (*Epirimerus pyri*), and Pear leaf blister (*Eriophyes pyri*) mites .

Biological Control

Rust mites are an important early-season food source for predatory mites.

Chemical Control

Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ Number of applications/ season	Preharvest Interval (days)
Agri-Mek SC (6) (pear rust mite only)	pear	170 – 340 mL	69 – 138 mL	2 (170 mL/ha) 1 (340 mL/ha)	28
Envidor 240 SC (23)	pome and stone fruit	750 mL	304 mL	1	7
Kumulus, Cosavet DF Edge (M)	apple, pear	6.0 kg	2.4 kg	1	1
Lime sulphur	pear	7.3 L/100 L of water			n/a
Minecto Pro (6 + 28)	pear	496 – 1000 mL	201 – 405 mL	1 L /ha	28
Nexter WP (21)	apple, pear cherry	300 g	121 g	2 (apple, pear) 1 (cherry)	25 (apple, pear) 7 (cherry)

Precautions

Agri-Mek: Must be applied in a minimum of 0.25% oil (not less than 10 L/ha). Toxic to bees, do not apply during crop blooming period.

Envidor: Post-bloom application only.

Kumulus: Sulphur is phytotoxic to Anjou and Cornice pears. Do not apply within 30 days of an oil spray. Do not use under intense sunshine or when temperature is above 27°C.

Lime sulphur: Apply at dormant.

Minecto Pro: Apply before a threshold of five rust mites/leaf is reached. Add 0.25 – 1% spray oil/ spray mixture.

SCALE INSECTS

European fruit (*Quadraspidiotus ostreaeformis*), European fruit lecanium (*Parthenolecanium corni*), Oystershell (*Lepidosaphes ulmi*), and San Jose (*Quadraspidiotus perniciosus*) scales.

Chemical Control

Apply control products thoroughly and uniformly to ensure satisfactory control of scale insects. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ Number of applications/ season	Preharvest Interval (days)
Closer (4C)	all fruit	200 – 400 mL	80 – 160 mL	2	7
Guardman dormant spray oil (NC)	all fruit	90 L	36 L		n/a
Movento 240 SC (23)	all fruit	365 – 435 mL	148 – 176 mL	4 (pome) 2 (stone)	7
Purespray Green spray oil (NC)	apple, pear, peach, plum	20 L/1000 L of water		2	0
Sivanto Prime (4D)	pome	750 – 1000 mL + 0.25% oil	304 – 405 mL + 0.25 % oil	2000 mL/ha (810 mL/acre)	14
Superior 70 oil (NC)	apple, pear, peach, plum nectarine	60 L	24.3 L		n/a

Precautions:

Closer: Registered only for San Jose scale. Do not make applications less than 7 days apart. Toxic to bees. Do not apply during crop flowering period or when flowering weeds are present in the treatment area.

Guardman spray oil: Do not apply just before or during freezing weather or rain.

Movento: Do not apply at intervals less than 14 days.

Purespray green spray oil: Do not apply to apple after the green tips are 1 cm long or to pears after green-tip stage. May cause bark damage on Red Delicious, Empire and Mutsu Apples.

Sivanto Prime: Allow 10 days between applications. Oil when mixed with Sivanto Prime may cause fruit injury to sensitive varieties of pears, particularly d'Anjou.

Superior 70 oil: Do not apply just before or during freezing weather or rain. Do not use after green tip stage.

SPOTTED WING DROSOPHILA (*Drosophila suzukii*)

Cultural control

Remove and dispose of infested ripe, overripe and rotten fruit which serve as source of food for larvae to complete development. Mowing the orchard floor immediately after harvest to destroy fruit on the ground may help.

Chemical Control

Keep cherries protected from straw colour up to harvest. Registered products control adults only, not larvae. Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ Number of applications /season	Preharvest Interval (days)
Danitol (3)	stone fruits	779 – 1559 mL	315 – 631 mL	1	
Delegate (5)		420 g	170 g	3	5 (cherry) 3 (prune, plum, apricot) 1 (peach, nectarine)
Entrust (5)	stone fruits	364 mL	147 mL	3	3 (cherry) 1 (peach, nectarine) 3 (plum, prune, apricot)
Exirel (28)	stone fruits	1000 – 1500 mL	405 – 604 mL	4	3
Harvanta 50 SL (28)	stone fruits	1200 – 1600 mL	485 – 647 mL	3	7
Imidan WP (1B)	stone fruits (except sweet cherries)	2.68 kg	1.08 kg	4(sour cherry, peach) 3 (plum)	7 (sour cherry) 14 (peach, plum)
Mako (3)	cherry	150 – 175 mL	61 – 71 mL	2	2
Malathion 85 E (1B)	cherry (control) other stone fruits (suppression only)	855 – 2500 mL (cherry) 610 – 855 mL (other stone fruits)	346 – 1012 mL (cherry) 245 – 346 mL (other stone fruits)	1 (2 for apricot)	3 (plum) 7 (other stone fruits)
Success (5)	stone fruits	182 mL	74 mL	3	3 (cherry) 1 (peach,

					nectarine) 3 (plum, prune, apricot)
Up-Cyde 2.5 EC (3)	cherry	245 – 285 mL	99 – 115 mL	2	2

Precautions

- Danitol: Reentry intervals/preharvest intervals are 23 days for thinning, 16 days for hand harvesting, 7 days for scouting and hand pruning, 3 days for mechanical harvesting, and 24 hours for all other activities. Toxic to bees.
- Delegate: Use application intervals of 30, 12 and 5 days for cherries if three applications are made, and 7 – 10 days for other stone fruits. Toxic to bees.
- Entrust: Allowed for organic production. Use application intervals of 28, 10 and 3 days for cherries if three applications are made, and 7 – 10 days for other stone fruits. Toxic to bees.
- Exirel: Do not tank mix with Flint, Pristine, Cabrio, Copper or Captan fungicides.
- Harvanta: Toxic to bees.
- Imidan: Do not use on sweet cherries. Reapply in 7 – 10 days.
- Mako: Short residual (3 – 5 days) when temperatures are above 25°C. May cause mite flare-ups. Toxic to bees.
- Malathion: May cause leaf drop or fruit finish problems on cherries especially under hot weather conditions or low water volumes. Works better above 20°C.
- Success: Use application intervals of 28, 10 and 3 days for cherries if three applications are made, and 7 – 10 days for other stone fruits. Toxic to bees.
- Up-Cyde: Short residual (3 – 5 days) when temperatures are above 25°C. May cause mite flare-ups. Toxic to bees.

TENTIFORM LEAFMINER (*Phyllonorycter mispilella*)

Biological Control

Several species of parasitic wasps and European Earwigs can keep leafminer populations below action thresholds in the absence of harmful control products.

Chemical Control

Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ Number of applications/ season	Preharvest Interval (days)
Altacor (28)	apple, pear	145 – 215 g	59 – 87 g	3	14
Agri-Mek 1.9 EC (6)	apple	750 mL	300 mL	2	28
Assail 70 WP (4)	apple, pear	80 mL	32 mL	2	7
Calypso 480 SC (4)	apple	145 – 290 mL	59 – 117 mL	3	30
Confirm 240 F (18)	apple	1 L	404 mL	4 L/ha	14

				(1.6 L/ac)	
Cormoran (4 + 15)	apple	700 mL	283 mL	6.9 L/ha (2.8 L/ac)	14
Delegate WG (5)	apple, pear	420 g	170 g	3	7
Intrepid 240 F (18)	apple	500 mL	202 mL	2 L/ha (0.8L/ac)	14
Minecto Pro (6 + 28)	apple, pear	496 mL	201 mL	1	28

Precautions

Altacor: Do not apply more than once every 10 days.

Agri-Mek: Apply with 0.25% summer oil.

Assail: Best results achieved when applied against the sap-feeder stages. Apply after pollination is complete and bees are no longer foraging in the orchard.

Calypso: Apply lower rate against first generation sap-feeder stage.

Confirm: Best results achieved when applied against eggs and sap-feeder stages.

Cormoran: Do not apply at intervals less than 12 days.

Delegate: Do not apply at intervals less than 7 days.

Intrepid: Apply at first egg hatch of first generation.

Minecto Pro: Apply with 0.25 – 1% spray oil. Target egg (to control new hatch) and early sap feeder stages of first and second generation tentiform leafminers when locally established thresholds have been reached.

WHITE APPLE LEAFHOPPER (*Typhlocyba pomaria*)

Chemical Control

Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for the most current product registrations.

Trade name	Crop	Rate (/ha)	Rate (/acre)	Maximum amount/ Number of applications /season	Preharvest Interval (days)
Assail 70 WP (4)	apple, pear	80 – 120g	32 – 48 g	2	7
Calypso 480 SC (4)	apple	145 mL	59 mL	875 mL	30
Sivanto Prime (4D)	apple	500 – 750 ml	202 – 304 mL	2000 mL/ha (810 mL/ac)	14

Precautions

Assail: Best results are achieved against nymphs; some suppression of adults. Apply after pollination is complete and bees are no longer foraging in the orchard. Do not apply more than twice/year for all labelled uses.

Calypso: Apply lower rate against first generation sap-feeder stage.

Sivanto Prime: Do not apply at intervals less than 10 days.

Control Product Group Number, Trade and Chemical Name Cross-Reference Table

Product Group Number (Chemical group)	Trade Name	Chemical Name
1B (Organophosphates)	Cygon Imidan Lagon Malathion	dimethoate phosmet dimethoate malathion
3 (Pyrethroids)	Mako Danitol	cypermethrin fenpropathrin
4A (Neonicotinoids)	Actara Assail Calypso Clutch Cormoran*	thiamethoxam acetamiprid thiacloprid clothiadin acetamiprid + novaluron
4C (Sulfoximines)	Closer TwinGuard*	sulfoxaflor sulfoxaflor + spinetoram
4D (Butenolides)	Sivanto Prime	flupyradifurone
5 (Spinosyns)	Delegate Entrust GF-120 Success	spinosad spinosad spinosad spinetoram
6 (Avermectins)	Agri-Mek Minecto Pro*	abamectin abamectin + cyantraniliprole
9D (Pyropenes)	Versys	afidopyropen
10 (Mite growth inhibitors)	Apollo	clofentezine
11 (BT microbials)	Bioprotec Dipel Foray	<i>Bacillus thuringiensis</i> <i>Bacillus thuringiensis</i> <i>Bacillus thuringiensis</i>
15 (Benzoylureas)	Rimon Cormoran*	novaluron acetamiprid + novaluron
18 (Diacylhydrazines)	Confirm Intrepid	tebufenozide methoxyfenozide
20B (Acequinocyl)	Kanemite	acequinocyl
20D (Bifenazate)	Acramite	bifenazate
21 (METI acaricides)	Nexter Magister*	pyridaben fenazaquin
23 (Tetronic and Tetramic acids)	Envidor Movento	spirodiclofen spirotetramat
25 (Beta-ketonitrile derivatives)	Nealta miticide	cyflumetofen
28	Altacor	chlorantraniliprole

(Diamides)	Exirel Harvanta Minecto Pro* Vayego	cyantraniliprole cyclaniliprole cyantraniliprole + abamectin tetraniliprole
29	Beleaf	flonicamid
(Flonicamid)		
UN	Dormant oil	mineral oil
(Unknown)	Lime sulphur	calcium polysulfide
	Insecticidal soap	fatty acids
	Surround	kaolin clay
	Virosoft	granulosis virus

* Combined products

Check the BC Tree Fruit Production Guide Online <https://www.bctfpg.ca/> for information on pests, monitoring and the most current product registrations and updates.