

Western Committee on Crop Pests Guide to Integrated Control of Insect Pests of Crops

Insect Management In Turf in Western Canada

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Recommendations for lawns and recreational areas not grazed by livestock.

Recommendations include both domestic and commercial registered products. Commercial products are available only to agricultural operations (sod farms) or certified applicators. Products listed are representative of currently registered products for turf pests, but are not a comprehensive list. Check with local and provincial regulations on use restrictions or certification requirements before using domestic or commercial products.

Ants	Hymenoptera: Formicidae
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Important: Mow the lawn before treatment. Keep off treated lawns until dry.

Cultural Control - Flood ant nests repeatedly to discourage colonization. Maintain adequate irrigation on turf to avoid dry spots that encourage ant nest development.

Chemical Control -

Control Product*	Active Ingredient	Rate (g AI/100 m ²)
Ant B Gon (Domestic) Ant Killer Liquid (Domestic)	borax	R.T.U liquid or solid bait
Dursban Turf (Commercial)	chlorpyrifos	10.8
Deltagard SC (Commercial)	deltamethrin	0.6
Scimitar CS (Commercial) Demand CS (Commercial)	lambda-cyhalothrin	0.37
Doktor Doom House & Garden (Domestic) Prelude 240 (Commercial)	permethrin	0.25% formulation (domestic) - 0.5% solution (commercial)
Trounce Lawn and Turf (Domestic)	potassium salts of fatty acids & pyrethrins	fatty acids – 48-142 pyrethrins – 0.48-1.42
Raid Ant, Roach & Earwig Bug Killer (Domestic)	pyrethrins, piperonyl butoxide, permethrin	pyrethrins 0.1-0.2% piperonyl butoxide 0.25-0.48% permethrin 0.2%
Blaze Pro Ant Destroyer (Domestic) Doktor Doom Ant Next & Ant Killer (Domestic)	pyrethrins, N-octyl bicycloheptene dicarboximide, permethrins	pyrethrins 0.05% N-octyl bicycloheptene dicarboximide 0.25% permethrins 0.2%

Insectigone Ant Killer (Domestic)	silicon dioxide	80% powder
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***Check product label carefully to ensure product can be used on ant hills/nests, lawns or turf. Not all ant control products are approved for use on turf.**

Restrictions -

- borax: Domestic products containing boric acid as liquids or powders are being cancelled, with sales ending in July 2018 and last date of allowable usage being July 22, 2019. Products as gels or baits will continue to be registered, but will have stronger label requirements to reduce exposure to the active ingredient. Keep out of reach of children and pets. Place gel or bait in areas not accessible to children or pets.
- chlorpyrifos: Commercial products - only approved for use on sod farms, golf courses, industrial sites and highway medians. Not for use around residential areas, parks, school grounds or playing areas
- deltamethrin: Commercial products. Delay irrigation or mowing for 24 hours following application. Do not apply more than 2 times per year. Observe buffer zones listed on product label.
- lambda-cyhalothrin: Commercial products. Maximum of 4 applications per year - spring and late summer. Do not apply when turf is water logged. Delay irrigation or mowing for 2 days after application. Observe buffer zone distance (up to 120 m) between sensitive freshwater/marine habitats and sprayed areas. Highly toxic to bees.
- permethrin: Domestic: Apply as spot treatment to ant nests
Commercial: For use only on home or residential lawns. Ant mounds: apply 4-7.5 L of solution to each mound and treat a 1 m diameter circle around mound. Apply in cool conditions (early morning or late evening) for best results.
- potassium salts of fatty acids/pyrethrins: Domestic products. Spray to wet. Repeat 10-14 days later if necessary
- pyrethrins, N-octyl bicycloheptene dicarboximide, permethrin: Domestic product. Apply directly to ant hills/nests.
- pyrethrins, piperonyl butoxide, permethrin: Domestic products. Apply directly to ant hills/nests.
- silicon dioxide: Domestic products. Apply to ant hills

Control Timing - Most damage to turf occurs from the adult ants building mounds on lawns. Treat in mid to late summer.

Aphodius Beetles (dung beetles)	<i>Aphodius</i> sp.	(Coleoptera: Scarabaeidae)
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Cultural Control - Regular aeration in conjunction with limited topdressing using manure composts will reduce habitat (thatch) and food for the beetles.

Chemical Control - No registered compounds

Control Timing - Aphodius beetle adults emerge in mid-June, laying eggs which hatch

shortly afterwards to grubs. Grubs feed through the summer, pupate in August, and overwinter as adults.

Black Turfgrass Ataenius	<i>Ataenius spretulus</i>	(Coleoptera: Scarabaeidae)
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Chemical Control -

Control Product	Active Ingredient	Rate (g AI/100 m ²)
Merit (Commercial)	imidacloprid	2.8
Acelepryn (Commercial)	chlorantraniliprole	5.6-8.8

Control Timing - Black Turfgrass Ataenius has the same life cycle as Aphodius beetles, with adults depositing eggs in May to June. Control efforts should be targeted prior to egg hatch (from peak flight to peak egg hatch).

Restrictions -

imidacloprid: Commercial. Applications should be made prior to egg hatch of the target pests, followed by sufficient irrigation or rainfall (5 -10 mm) to move the active ingredient through the thatch. Avoid over watering (more than 20 mm). Avoid mowing until after irrigation or rainfall has occurred. Do not apply more than once per year. Do not apply within 30m of sensitive aquatic systems.

chlorantraniliprole: Commercial. Apply from early April to late September. Do not make more than one application per season. Do not apply within 1 metre of aquatic habitats when using field sprayers.

Chinch Bugs	<i>Blissus leucopterus</i>	Hemiptera: Blissidae
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Cultural Control - Minimize drought stressed areas - chinch bugs like dry lawns. Reduce thatch, and do not over fertilize lawns with high nitrogen fertilizers. Remove plant debris in fall to reduce overwintering sites.

Biological Control - Chinch bugs are susceptible to predatory bugs, spiders and parasitic wasps.

Chemical Control -

Control Products	Active Ingredient	Rate (g AI/100 m ²)
Dursban Turf (Commercial)	chlorpyrifos	10.8
Arena (Commercial)	clothianidin	1.75-2.5
Deltagard SC (Commercial)		

	deltamethrin	0.6
Met52 EC Bioinsecticide (Commercial)	<i>Metarhizum anisopliae</i> Strain F52	7-10.6
Trounce Lawn & Turf Insecticide (Domestic)	potassium salts of fatty acids & pyrethrins	fatty acids – 48-142 pyrethrins – 0.48-1.42

Restrictions -

- chlorpyrifos: Commercial products - only registered for use on sod farms, golf courses, industrial sites and highway medians. Not for use around residential areas, parks or playing areas.
- clothianidin: Commercial products. Observe buffer zones on label for sensitive terrestrial, freshwater and marine habitats. Do not make more than one application per season. Apply when insect populations reach damaging thresholds.
- deltamethrin: Commercial products. Delay irrigation or mowing for 24 hours following application. Do not apply more than 2 times per year. Observe buffer zones listed on product label.
- Metarhizum anisopliae* Strain F52: Commercial products. Spray to wet foliage but avoid runoff. Reapply at four week intervals if necessary.
- potassium salts of fatty acids/pyrethrins: Domestic products. Spray to wet. Repeat 10-14 days if necessary

- Control Timing -** Adults overwinter and lay eggs in the spring. Nymphs and adults suck on sap from grass blades throughout the summer, when control efforts should be undertaken.

Crane Fly Larvae (Leatherjackets)	<i>Tipula paludosa</i>	Diptera: Tipulidae
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- Cultural Control -** Reduce thatch layer, reduce irrigation in early fall when larvae are more susceptible to drought. Avoid overwatering and ensure irrigation systems are not leaking and creating continually moist soil conditions favourable for crane flies

Chemical Control -

Control Product	Active Ingredient	Rate (g AI/100 m ²)
Acelepryn (Commercial)	chlorantraniliprole	1.12-2.25
Dursban Turf (Commercial) Pyrate (Commercial)	chlorpyrifos	9.6 – 12
Arena (Commercial)	clothianidin	2.75
Merit (Commercial)	imidacloprid	2.8

Restrictions -

- chlorantraniliprole: Commercial products. Apply from early April to late September. Do not make more than one application per season. Do not apply within one metre of aquatic habitats when using field sprayers.
- chlorpyrifos: Commercial products. Approved for use only on sod farms, golf courses, industrial sites and highway medians. Not for use around residential areas, parks or playing areas. Apply as drenching spray in water in late fall after the flight of adult crane flies has ceased for the year.
- clothianidin: Commercial products. Apply in the spring, when larvae are mature but prior to pupation or in the fall prior to egg hatch. Only apply when populations reach damaging thresholds. Clothianidin is persistent, may carryover, and may contaminate groundwater.
- imidacloprid: Commercial products. Suppression only. Application timing should commence when adults take flight and begin laying eggs in August and September. Apply only once per year.

Control Timing - Adults emerge during the summer and lay eggs. Larvae hatch from the eggs in late summer and overwinter as larvae. Most turf damage occurs in late fall and early spring. Control is most effective in late fall.

Glassy Cutworm	<i>Apamea devastator</i>	Lepidoptera: Noctuidae
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Biological Control - Numerous predators (ground beetles) and parasites (wasps and flies) can affect populations of glassy cutworm, but the level of control can vary from year to year and location to location.

Chemical Control -

Control Product	Active Ingredient	Rate (g AI/100 m ²)
Pyrate (Commercial)	chlorpyrifos	10.8
Deltagard SC (Commercial)	deltamethrin	0.6

Control Timing - Adults lay eggs in August, hatching shortly after, with the larvae feeding on host plants throughout the fall, overwintering and resuming feeding in the spring. Pupation occurs in mid-summer. Control efforts should be focused during the fall and early spring.

Restrictions -

- chlorpyrifos: Commercial products - only registered for use on sod farms, golf courses, industrial sites and highway medians. Not for use around residential areas, parks or playing areas. Do not water or mow for 12-24 hours after treatment. Maximum of two applications per season.
- deltamethrin: Commercial products. Delay irrigation or mowing for 24 hours following application. Do not apply more than 2 times per year. Observe buffer zones listed

on product label.

Slugs, Snails	Mollusca: Gastropoda
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Cultural Control - Hand picking is effective on small populations. Placing a wooden board adjacent to the lawn will provide a shelter for slugs on the underside of the board to protect themselves from the sun. Check boards daily.

Biological Control - Slugs and snails have numerous natural enemies such as toads, snakes, ground beetles, wild birds and ducks.

Chemical Control -

Control Product	Active Ingredient	Rate (g AI/100 m ²)
Safer's Slug & Snail Bait (Commercial)	ferric sodium EDTA	12
Sluggo Professional Slug & Snail Bait (Commercial)	ferric phosphate	0.34-1.25

Control Timing - Slugs and snails have various life cycles depending on the species, and overwinter in all life stages. Control efforts should be focused when most plant damage occurs - when plant growth is tender and there is adequate moisture in the surrounding soil and vegetation for the slugs and snails to successfully propagate and survive. Apply in evening when slugs are active.

Restrictions -

ferric sodium EDTA: Commercial product. Do not contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

ferric phosphate: Commercial product. This product may be toxic to fish and other aquatic organisms. Avoid contamination of fish-bearing waters.

Note: While there are several domestic products approved for use against slugs and snails for flower and vegetable gardens, none are registered for use directly on turf. Some labels specifically state: "Application is permitted only to non-turf areas".

Sod Webworm	<i>Parapediasia sp & Pediasia sp.</i>)	Lepidoptera: Crambidae
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Cultural Control - Fertilize and water. Damage can be outgrown by a healthy, vigorous stand of turf. Considerable damage may occur if irrigation is not applied during periods of drought, or close mowing is used.

Biological Control - No commercial products are available for biological control of sod webworm, but predaceous birds, ground beetles and rove beetles can have an influence on sod

webworm populations. Parasites such as parasitic wasps, microsporidia and fungal diseases can also impact populations.

Chemical Control -

Control Product	Active Ingredient	Rate (g AI/100 m ²)
Dursban Turf (Commercial)	chlorpyrifos	10.8
Deltagard SC (Commercial)	deltamethrin	0.6
Conserve 120 SC (Commercial) Conserve 480 SC (Commercial)	spinosad	0.12 - 0.48
Conserve 120 SC Naturalyte (Domestic)	spinosad	0.24-0.48

Control Timing - Sod webworms have four life stages, with the pupal stage being the overwintering stage. Adults emerge in early spring, laying eggs which hatch about a week later. Control efforts should focus on the early larval stages (about 2-3 weeks after peak adult flight), which is the stage most vulnerable to insecticides.

Restrictions –

chlorpyrifos: Commercial product. Only registered for use on sod farms, golf courses, industrial sites and highway medians. Not for use around residential areas, parks or playing areas. Do not water or mow for 12-24 hours after treatment.

deltamethrin: Commercial products. Delay irrigation or mowing for 24 hours following application. Do not apply more than 2 times per year. Observe buffer zones listed on product label.

spinosad: Domestic and commercial products. Do not water or mow for 12-24 hours after application. Do not reapply within less than 7 days. Do not apply more than 4 times/year. Do not apply immediately after a rainfall or if rain is forecast within 48 hours. Highly toxic to bees and aquatic invertebrates. Do not contaminate aquatic habitats.

White Grub	Coleoptera: Scarabaeidae
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White grub (including Japanese Beetle and European Chafer) (*Popillia japonica* & *Rhizotrogus majalis*)

Cultural Control - Maintaining a healthy lawn by proper cutting, fertilization, and irrigation makes the lawn less attractive to egg-laying females, who are attracted to bare spots and thin areas of the lawn. It also makes the lawn less susceptible to the damage caused by grub feeding activities.

Biological Control - White grubs are susceptible to numerous agents, including viruses, bacteria, fungi, parasitic nematodes, mites, wasps and flies, and vertebrate predators such as birds and skunks. Vertebrate predators can cause extensive damage to turf while

rooting for the grubs.

Chemical Control -

Control Product	Active Ingredient	Rate (g AI/100 m ²)
Acelepryn (Commercial)	chlorantraniliprole	1.12 - 1.76
Arena (Commercial)	clothianidin	1.25-2.5
Bayer Advanced Season Long Grub Control (Domestic) Merit (Commercial)	imidacloprid	2.8

Restrictions -

chlorantraniliprole: Commercial products. Do not make more than 1 application per season. Buffer zones of 1 m must be maintained for the protection of all freshwater and shallow (<1m) marine habitats. Chlorantraniliprole is persistent, may carryover, and may result in contamination of groundwater.

clothianidin: Commercial products. Preventative – make applications during peak egg hatch. Curative – make applications after egg hatch or when turf damage is evident. Do not make more than one application per season. Clothianidin is persistent, may carryover, and may contaminate groundwater.

imidacloprid: Domestic and commercial products. Applications should be made prior to egg hatch of the target pests, followed by sufficient irrigation or rainfall (5 -10 mm) to move the active ingredient through the thatch. Avoid over watering (more than 20 mm). Do not apply through any irrigation system. Avoid mowing until after irrigation or rainfall has occurred. Do not apply more than once per year.

Control Timing -

European Chafer has a one year life cycle, with eggs being laid in August. Larvae (grubs) hatch and feed through the fall and spring. Pupation occurs in late spring, with adults emerging in late May. Control efforts should be focused during active feeding periods in late fall and early spring.

June beetles have a 3 year life cycle, with the larval stage bridging all 3 years. Control efforts should be focused towards the earlier instars in late summer and early fall.