Insecticide Options in 2024

Welcome to our comprehensive quick reference guide for insecticide options and pest management strategies. In this document, we provide a concise overview of key insecticide options, and threshold guidelines to optimize crop protection and enhance yields. While this quick factsheet offers valuable insights, we encourage you to delve deeper into the latest updates and specific recommendations available in the current Guide to Crop Protection for the most up-to-date information and tailored strategies for your agricultural practices.

Key Pests & Thresholds

It is important that growers and agronomists diligently scout for insect pests that impact their crops as rapid outbreaks can occur that may severely impact crop yield or quality (Table 1). However, presence of a pest insect alone does not automatically warrant an insecticide application as it is important to consider crop stage, environmental conditions, threshold information, and presence of beneficial insects.

Economic Injury Level describes the lowest amount of crop injury or smallest number of insect pests that cause damage at a value equivalent to the economic costs of management.

Economic Threshold describes the level of damage or density of insects at which control measures are economically warranted. Under these conditions, the cost of control is less than the value of the crop damage due to pest pressure. Intervening at this timing is intended to prevent an increasing pest population from reaching the economic injury level.

Nominal Threshold describes a decision guideline only. This educated estimate is based on experience or from extrapolating economic threshold information from pests that impact similar crop hosts. Research has not been conducted to quantify the impact of the insects on the specific crop.

TABLE 1. Summary of key pests and crop hosts including damage and intervention guidelines.

CROP(S)	INTERVENTION GUIDELINES
Bertha Armyworm: Causes defoliation evidenced by outer layers of stems and pods chewed resulting in whitish appearance and holes chewed in pods. Scout for larvae two weeks after peak adult emergence (usually late July through early August) by shaking plants in a 1/4 square metre area and carefully check soil surface for dislodged larvae. Provincial Ag Ministries trap adults and post results, weekly on provincial websites and through the Prairie Pest Monitoring Network. It takes about six weeks to complete development. During heat of the day, larvae will often be found under leaves or on soil surface. Small larvae can be easily confused with diamondback moth larvae but don't wriggle or drop from silken threads. To help get an idea of potential risk levels, consider participating in the provincial monitoring programs.	
Canola, Mustard	Find the number of larvae per square metre and consult the economic threshold chart on Canola Encyclopedia.
Cabbage Seedpod Weevil: Although adults feed on flower buds, most of the economic crop damage occurs when larvae feed within pods and destroy developing seeds. When larvae exit pods, they leave small holes which leave the pods susceptible to premature shattering. Scout as crops begin to flower and, if warranted, apply insecticide to target adults when crops are 10 to 20 per cent flower to avoid eggs being laid in newly formed pods.	
Canola, Mustard	An economic threshold of 25 to 40 weevils per 10 sweeps on average is recommended. An insecticide should be applied at 10 to 20 per cent bloom. Yellow mustard is resistant and only brown and oriental mustard varieties require monitoring and potentially insecticide control of the weevil.
Cutworm: Scout for cutworms from emergence to early July. Look for notched, wilted, dead, or cut-off plants with plants missing from rows or bare patches appearing in field. Often, cutworms will be close to damaged plants and on the edges of bare patches and can be most abundant in patches or a specific area of a field. Hilltops, south facing slopes and drier parts of the field are most susceptible but they can be located anywhere in field. If damage is observed but no cutworms are seen, search through the top 2-6 cm of soil to confirm cutworms are the cause as larvae feed primarily at night and burrow underground during heat of day.	
Chickpea, Dry Bean, Soybean	A nominal threshold of one or more larvae per metre of row, when larvae are small (less than 2 cm), or 20 per cent of plants cut.
Lentil, Pea	Two to three cutworms per square metre. Sometimes it is most economical to just treat infested patches, and not whole fields.
Barley, Oat, Wheat	Three to four larvae per square metre (Pale western, Dingy) and five to six larvae per square metre (Red-backed). Sometimes it is most economical to just treat infested patches, and not whole fields.
Canola, Flax, Mustard	Nominal threshold of 25-30 per cent stand reduction has been suggested. An economic threshold of four to six larvae per square metre may warrant control for pale western, redbacked and darksided cutworms. Sometimes it is most economical to just treat infested patches, and not whole fields.
Diamondback Moth: Larval feeding damage to leaves is usually considered to have a minor effect on yield, but larval feeding on buds and flowers can be more damaging, especially when plants are under abiotic stress (such as drought) and cannot compensate by producing new buds and flowers. Scout for diamondback moth larvae from late May through to early September by shaking plants to dislodge larvae from canopy. It takes about 32 days to develop from egg to adult, and there may be several generations per year.	
Canola, Mustard	100 to 150 larvae per square metre in immature to flowering plants. 200 to 300 larvae per square metre in plants with flowers and pods. These threshold numbers are based on stands averaging 150 to 200 plants per square metre. In areas where stands are thinner, the economic threshold should be lowered accordingly. A nominal threshold of 25 to 33 per cent defoliation with larvae still present can be applied at seedling stage.

CROP(S)	INTERVENTION GUIDELINES
Flea Beetle: Shot-holes in leaves to complete destruction of seedling plants from stem feeding in late May through June. Holes chewed in pods in August (occasional). No economic threshold established for fall populations.	
Canola, Mustard	When 25 per cent of leaf surface defoliation and flea beetles are continuing to feed. Inspect stems and petioles when scouting. If damage is only along the field margins and beetles are still congregated there, then control measures should be applied to the damaged areas only.
Grasshopper: Crop damage through defoliation of leaves or clipping of pods and flowers. Most problematic in dry areas (receiving less than 750 mm per year via rain or snow). The most serious economic damage due to grasshoppers begins when they are in the third to fifth nymphal stages (wing buds begin to show). Lentil and flax crops are particularly sensitive to grasshopper damage and can sustain direct yield loss through the clipping of flowers, pods, or bolls from the plant and, therefore, monitoring is crucial from the early bud stage through pod or boll development.	
Chickpea, Soybean	Generally, not a preferred host for grasshopper unless other food sources are low. May notice grasshoppers feeding on weeds in field preferentially to crops.
Dry Bean	Substantial yield loss does not occur until up to 35 per cent defoliation occurs before bloom and 15 per cent after bloom.
Faba Bean	Economic thresholds have not been established, but faba bean is a better host than some other legumes to two-striped grasshopper.
Lentil	Two grasshoppers per square metre during the flowering and podding stages. Damage accumulates on flowers.
Pea	Typically, counts of less than 10 grasshoppers per square metre will not cause economic losses. Peas are not a preferred host of some grasshopper species.
Cereals	Eight to 12 grasshoppers per square metre.
Canola, Mustard	Seven to 12 grasshoppers per square metre. The higher end of that range may be more appropriate in a typical canola crop as, given a choice, most grasshopper species prefer cereals to canola. However, in very hot and dry conditions, economic loss can be experienced at even lower than seven grasshoppers per square metre.
Flax	Two grasshoppers per square metre once bolls have formed.
Lygus Bug: Adults and nymphs pierce plant tissue to suck plant sap and inject digestive enzymes. Lygus at the third instar or larger can damage buds, flowers, and seeds. Lygus bug adults can be confused with alfalfa plant bug adults. Feeding on seeds leads to discolouration (chalk spot) or darkening and shriveling which can be particularly concerning for downgrading in faba bean marketed for human consumption. Recent research has shown that low levels of lygus in canola may have a neutral or positive yield impact due to compensatory growth, in good growing condition.	
Faba Bean	Research is ongoing to develop economic threshold. Preliminary information recommends no action when there is two adults or later instar nymphs per sweep.
Lentil	10 or more lygus per 25 sweeps. If seven to 10 lygus per 25 sweeps are found, continue monitoring. If less than seven lygus per 25 sweeps are found, no treatment is necessary. A single insecticide application at late flowering to early pod should be sufficient for control.
Canola	Nominal threshold of two to three per sweep at late flower to early pod.

CROP(S)	INTERVENTION GUIDELINES
Pea Aphid: Crop damage is caused by sucking plant sap. Yield loss, due to reduced seed formation and size, results from feeding on the flowers and early pods. As such, the key scouting and intervention timing is during flowering to early pod development. Regular scouting is key as aphid populations can both be regulated by beneficial insects but also increase rapidly to their ability to produce multiple generations per year.	
Chickpea	No thresholds established. Pea aphids typically not an insect of concern.
Faba	Economic threshold of 34-50 aphids per main branch provides an approximate seven-day lead time before populations reach economic injury level (96 to 142 per main branch).
Lentil	Economic threshold of 29-43 aphids per sweep provides an approximate seven-day lead time before populations reach economic injury level (64 to 92 per sweep).
Pea	Economic threshold of two to three aphids per eight-inch plant tip, or nine to 12 aphids per sweep when approximately 25 per cent has begun to flower.
Wheat Midge: Crop damage occurs during the larval stage as feeding occurs on the developing wheat kernel, causing it to shrivel, crack and become deformed. Damage to the crop is not readily apparent as there is no visible, external changes in colour, size or shape of the affected wheat head. Damage can only be detected by inspecting the developing seed within the glumes.	
Wheat	Economic threshold for midge susceptible varieties — yield only: one adult midge per four to five heads. At this level of infestation, wheat yields will be reduced by approximately 15 per cent if the midge is not controlled. To maintain optimum grade (midge susceptible varieties): one adult midge per eight to 10 wheat heads during the susceptible stage. Scouting should occur in the evening when the female midge are most active. Scouting should occur daily from the time wheat heads are visible to mid-flowering. There is no economic threshold for midge tolerant wheat varieties designated with a "VB".
Wireworm: Crop damage is caused as larvae move up in the soil profile and feed on germinating seeds or young seedlings. The larvae shred the stems but seldom cut them off. The central leaves die, but outer leaves often remain green for some time. Damaged plants soon wilt and die, resulting in thin stands. If wireworms are found in large populations management would be required in following years.	
Cereals & Oilseeds	Economic thresholds have not yet been developed in Canada.

Foliar Options

Various foliar insecticide products exist that provide solutions for several pest and crop combinations (Tables 2 and 3). Beware, product options will differ in their efficacy, toxicity for user, cost, and market availability. Where options are available, rotating modes-of-action is an important resistance management strategy. Take into consideration the number of applications that can be made in a growing season with each insecticide and start to plan accordingly. Furthermore, applying registered product options according to label guidelines, within the targeted preharvest interval (PHI), and according to application strategies that promote the most efficacious result are all important considerations for successful pest management.

Preharvest Interval (PHI) is the minimum number of days between the last application of a pesticide and when the crop can be harvested. Harvest is the cutting of the crop or removal of the produce from the plant. It includes direct-combining, cutting (swathing) or grazing; it does not include swath-combining or baling for hay. Following PHI guidelines on pesticide labels is important to ensure that the maximum residue limit (MRL) for a crop is not exceeded.

Maximum Residue Limit (MRL) is the maximum amount of pesticide residues that are tolerated on or in a food product; Actual amounts should be lower than these values when the pesticide is used according to label directions. This value is legally established in accordance with Health Canada's scientific assessments that determine the consumption of the treated food products will not be a concern for human health.

TABLE 2. Foliar insecticide options for pest and crops. Preharvest interval (PHI) is denoted by number of days in brackets behind the crop. Certain products have a maximum stage of application rather than a PHI.

ACTIVE INGREDIENT	PRODUCT(S)	PULSES (PHI)[1]	CEREALS (PHI)[1]	OILSEEDS (PHI)[1]
Bertha Armyworm				
Chlorantraniliprole	Coragen®/Coragen® MaX	n/a	n/a	Canola (1), Flax (1), Mustard (1)
Cypermethrin	UP-Cyde® 2.5 EC, Ship 250 EC	n/a	n/a	Canola (30)
Deltamethrin	Decis®100 EC/ Decis®5EC	n/a	n/a	Canola (7), Flax (7), Mustard (7)
	Advantage Deltamethrin 5EC, Poleci® 2.5 EC	n/a	n/a	Canola (7), Mustard (7)
Cabbage Seedpod Weevil				
Deltamethrin	Decis®100 EC/ Decis®5EC, Advantage Deltamethrin 5EC, Poleci® 2.5 EC	n/a	n/a	Canola (7), Mustard (7)
Cutworm				
Chlorantraniliprole	Coragen®/Coragen® MaX	Chickpea (1), Dry Bean (1), Faba Bean (1), Lentil (1), Pea (1), Soybean (1)	Barley (1), Oat (1), Wheat (1)	Canola (1), Flax (1), Mustard (1)
Cypermethrin	UP-Cyde® 2.5 EC	n/a	Barley (40), Wheat (40), Oat (31)	n/a
Deltamethrin	Decis®100 EC/ Decis®5EC	Chickpea (7), Dry Bean (7), Faba Bean (7), Lentil (7), Pea (7)	Barley (40), Wheat (40), Oat (31)	Flax (40), Canola (7)
	Advantage Deltamethrin 5EC, Poleci® 2.5 EC	Lentil (30)	n/a	n/a
Permethrin	Pounce® 384 EC, Perm-Up®,IPCO Syncro,	Lentil (5 leaf), Pea (5 leaf)	Barley (5 leaf), Oat (5 leaf), Wheat (5 leaf)	Canola (5 leaf), Flax (5 leaf)
	Ambush®	Lentil (7), Pea (7)	Barley (7), Oat (7),	n/a
Tetraniliprole	Vayego® 200 SC	Soybean (14)	n/a	n/a

ACTIVE INGREDIENT	PRODUCT(S)	PULSES (PHI)[1]	CEREALS (PHI)[1]	OILSEEDS (PHI)[1]
Diamondback Moth Larvae				
Chlorantraniliprole	Coragen®/Coragen® MaX	n/a	n/a	Canola (1), Mustard (1)
Deltamethrin	Decis®100 EC/ Decis®5EC, Advantage Deltamethrin 5EC, Poleci® 2.5 EC	n/a	n/a	Canola (7)
Malathion	Malathion 85E, Malathion 500	n/a	n/a	Canola (7)
Flea Beetle[2]				
Carbaryl	Sevin XLR	n/a	n/a	Canola (seedling)
Cypermethrin	UP-Cyde® 2.5 EC, Ship 250 EC	n/a	n/a	Canola (30), Mustard (30)
Deltamethrin	Decis®100 EC/ Decis®5EC, Advantage Deltamethrin 5EC, Poleci® 2.5 EC	n/a	n/a	Canola (7), Mustard (7)
Malathion	Malathion 85E	n/a	n/a	Canola (7), Mustard (7)
Malathion	Malathion 500	n/a	n/a	Canola (7)
Permethrin	Pounce® 384 EC, Perm-Up®, IPCO Syncro, Ambush®	n/a	n/a	Canola (5 leaf)
Grasshopper				
Chlorantraniliprole	Coragen®/Coragen® MaX	Chickpea (1), Dry Bean (1), Faba Bean (1), Lentil (1), Pea (1), Soybean (1)	Barley (1), Oat (1), Wheat (1)	Canola (1), Flax (1), Mustard (1)
Cypermethrin	UP-Cyde® 2.5 EC	n/a	Barley (45), Wheat (30)	Canola
Deltamethrin	Decis®100 EC/ Decis®5EC	Chickpea (7), Dry Bean (7), Faba Bean (7), Pea (7)	Barley (40), Oat (31), Wheat (40)	Canola (7), Flax (7), Mustard (7)
	Advantage Deltamethrin 5EC, Poleci® 2.5 EC	n/a	Barley (40), Oat (31), Wheat (40)	Canola (7), Flax (40), Mustard (7)
Dimethoate	Cygon® 480-Ag	n/a	n/a	Canola (21)
	Lagon® 480	n/a	Barley (35), Oat (35), Wheat (35)	n/a
Malathion	Malathion 85E	Lentil (14)	Barley (7), Oat (7), Wheat (7)	Canola (7), Flax (7), Mustard (7)
	Malathion 500	Lentil (30)	Barley (7), Oat (7), Wheat (7)	Canola (7), Flax (7)

ACTIVE INGREDIENT	PRODUCT(S)	PULSES (PHI)[1]	CEREALS (PHI)[1]	OILSEEDS (PHI)[1]
Lygus Bug				
Carbaryl	Sevin® XLR	Dry Bean (5)	n/a	n/a
Deltamethrin	Decis®100 EC/ Decis®5EC	Dry Bean (7), Faba Bean (7), Lentil (7)	n/a	Canola (7), Flax (7), Mustard (7)
	Advantage Deltamethrin 5EC, Poleci® 2.5 EC	n/a	n/a	Canola (7), Mustard (7)
Dimethoate	Cygon® 480	Dry Bean (7), Soybean (30),	n/a	n/a
	Lagon® 480	Soybean (30)	n/a	n/a
Flonicamid	Carbine™	Chickpea (7), Dry Bean (7), Faba Bean (7), Lentil (7), Pea (7)	n/a	n/a
Pea Aphid				
Dimethoate	Cygon® 480	Pea (3)	n/a	n/a
	Lagon® 480	Pea (21)	n/a	n/a
Flonicamid	Carbine™	Chickpea (7), Dry Bean (7), Faba Bean (7), Lentil (7), Pea (7)	n/a	n/a
Flupyradifurone	Sivanto® Prime	Chickpea (7), Faba Bean (7), Lentil (7), Pea (7)	n/a	n/a
Malathion	Malathion 85E	Pea (3)	n/a	n/a
Spirotetramat	Movento®	Chickpea (7), Lentil (7), Pea (7)	n/a	n/a
Wheat Midge				
Dimethoate	Cygon® 480-Ag	n/a	Wheat (35)	n/a
	Lagon® 480	n/a	Wheat (35)	n/a

Information adapted from Saskatchewan Guide to Crop Protection. Consult label or manufacturer for more detail. Always read and follow label directions. This information is only a guide, if label information differs, follow label instructions.

NOTE: As of December 2020, all productions and formulations of insecticides containing chlorpyrifos (Lorsban™ 4E, Pyrinex® 480EC, Nufos® 4E, Citadel 480 EC, Pyrifos® 15G, Warhawk® 480, and Sharphos) have been cancelled by PMRA. Retailers had until December 2022 to sell remaining inventory to producers. In turn, producers had until December 2023 to apply any remaining products before the product was officially unregistered and unusable for application.

[1] PHI= Preharvest interval denoted by number of days in brackets behind crop. Maximum stage of application is indicated for some products.
[2] Not all product labels claim control of both crucifer and striped flea beetle. Refer to specific product label for more information.

TABLE 3. Description of mode of action based on chemical group and active ingredient.

ACTIVE INGREDIENT	PRODUCT(S)	HOW IT WORK & APPLICATION CONSIDERATION[1,2]
Pyrethroids (3A)		
Cypermethrin	UP-Cyde® 2.5 EC, Ship 250 EC	Works as a contact and stomach poison. Use sufficient water for good coverage. Control of immature (up to fourth instar) grasshoppers only and use higher label rates for mature insect stages (grasshoppers) or severe infestations. Activity of grasshoppers is reduced as soil temperature increases. Application for grasshopper control should be made at temperatures below 25°C. Spraying for grasshoppers should be delayed until evening if daytime temperatures are above 25°C. After application for cutworm leave soil surface undisturbed for five days.
Deltamethrin	Decis®100 EC/ Decis®5EC, Advantage Deltamethrin 5EC, Poleci® 2.5 EC	Non-systemic active that works by contact and ingestion. Use sufficient water for good coverage and higher rates for severe infestations, on dense foliage or when several insect growth stages are present. Spraying under a strong temperature inversion, when temperature exceeds 25°C, or within one hour of rain will result in a reduction in control. Best control achieved when deltamethrin is applied during cooler periods of the day.
Permethrin	Pounce®, Perm-Up®, IPCO Syncro, Ambush®	Works as a contact and stomach poison with no systemic or fumigant properties. Use sufficient water for good coverage and higher label rates for severe infestations, adult insects, and dense foliage. For cutworm control, application should be made under warm, moist conditions in the evening or at night. Use high rates if larvae are near maturity or soil conditions are dry. Do not disturb soil surface for five days after treatment.
Butenolides (4D)		
Flupyradifurone	Sivanto® Prime	Broad spectrum systemic activity that works by contact and ingestion. Do not apply within one hour of rain. Apply in a minimum water volume of 10 USG per acre.
Tetronic/Tetramic Acid Derivatives (23)		
Spirotetramat	Movento®	Systemic movement through phloem and xylem to all plant tissues including new shoot, leaf, and root growth. Apply in minimum of 30 USG per acre. Mode of action is primarily by ingestion by immature insect life stages. Insect death occurs due to the inability to progress to the next development stage. Adults produce less offspring following exposure. For best results apply when insect populations begin to build and before a damaging population becomes established.
Diamides (28)		
Chlorantraniliprole	Coragen®/ Coragen® MaX	Works through ingestion of treated plant material and causes muscle paralysis in the insect; feeding quickly comes to a stop in as little as seven minutes. The grasshopper will become lethargic and die, although complete death may take up to a few days after ingestion. Thorough coverage is essential for optimal control. Use the high rate under heavy pest pressure and/or when larger larvae are present.
Flonicamids (29)		
Flonicamid	Beleaf® 50SG, Carbine™	Mode of action is contact and ingestion. This provokes rapid and irreversible feeding cessation. The mouthpart is impaired, and pest is unable to penetrate plant tissues. Complete death may take up to a few days after coming into contact and/or ingestion of product. Apply in sufficient water for good coverage. Rates and spray volumes should be increased under extreme pest populations or dense foliage.

[1] Information adapted from Saskatchewan Guide to Crop Protection. Consult label or manufacturer for more detail. Always read and follow label directions. This information is only a guide, if label information differs, follow label instructions.
[2] Certain products such as Sivanto® Prime, Movento®, Beleaf® 50SG, and Vayego® 200 SC are predominately used in horticulture markets and, therefore, cost and accessibility may be prohibitive to their use in Saskatchewan pulse, cereal, and oilseed crops.

Seed Treatment Choices

Insecticidal seed treatments are not effective against later season pests, but they do offer protection against damage from early-season feeding of cutworm, flea beetles and wireworms. Seed treatments are also recommended for protection against pea leaf weevil in pea and faba bean crops as the most critical damage comes from the larvae feeding on the nodules and research indicates that foliar insecticide does not prevent yield loss. Insecticidal seed treatments protect the crop from insect pests below the surface as well. For more information on additional insect pests and insecticidal seed treatment options, consult the Guide to Crop Protection.

Formulated as seed treatments the active ingredients that target cutworm, flea beetle, wireworm and pea leaf weevil, work via ingestion and fall into three chemical groups: Neonicotinoids (clothianidin, imidacloprid, and thiamethoxam), Butenolides (flupyradifurone) and Diamides (chlorantraniliprole, clothianidin, and cyantraniliprole) (Table 4).

TABLE 4. Summary of seed treatment options that target cutworm, flea beetle, and pea leaf weevil pests.

PEST	ACTIVE INGREDIENT	PRODUCT(S)	PULSES	CEREALS	OILSEEDS
Cutworm	Chlorantraniliprole	Lumivia™ CPL	Chickpea, Dry Bean, Faba Bean, Lentil, Pea	Barley, Oat, Wheat	n/a
	Cyantraniliprole	Fortenza® Advanced, Lumiderm™	n/a	n/a	Canola, Mustard
Flea Beetle	Clothianidin	NipsIt INSIDE®	n/a	n/a	Canola
	Clothianidin	Prosper® EverGol®	n/a	n/a	Canola, Mustard
	Cyantraniliprole	Fortenza® Advanced, Lumiderm™	n/a	n/a	Canola, Mustard
	Flupyradifurone	BUTEO™ Start	n/a	n/a	Canola
	Imidacloprid	Sombrero® 600 FS	n/a	n/a	Canola, Mustard
	Thiamethoxam	Helix® Vibrance®	n/a	n/a	Canola
Pea Leaf Weevil	Chlorantraniliprole	Lumivia™ CPL	Chickpea, Dry Bean, Faba Bean, Lentil, Pea	n/a	n/a
	Thiamethoxam	Cruiser® 5FS	Faba Bean, Pea	n/a	n/a
	Imidacloprid	Trilex® EverGol® SHIELD	Faba Bean, Pea	n/a	n/a
Wireworm	Broflanilide	Teraxxa® F4	n/a	Barley, Oat, Wheat, Rye, Triticale	n/a
	Chlorantraniliprole	Lumivia™ CPL	Lentil, Pea	Barley, Oat, Wheat, Rye	n/a
	Cyantraniliprole	Fortenza® Advanced	n/a	n/a	n/a
	Clothianidin	NipsIt INSIDE®	n/a	Wheat	n/a
	Imidacloprid	Sombrero® 600 FS	Soybean	Barley, Wheat	n/a
	Imidacloprid	Raxil PRO Shield®	n/a	Barley, Oats, Wheat	n/a
	Thiamethoxam	Cruiser® 5FS	Chickpea, Lentil, Pea, Faba Bean, Soybean	Barley, Wheat	n/a
	Thiamethoxam	Cruiser® Vibrance® Quattro	n/a	Barley, Oats, Wheat, Rye, Triticale	n/a

Consult label or manufacturer for more detail. Always read and follow label directions. This information is only a guide, if label information differs, follow label instructions. Check inoculant compatibility when applying seed treatment with a liquid or peat inoculant on pulse crops.

Grasshopper Bait Products

Spreadable wheat bran bait products offer additional solutions for grasshopper control and use as part of an integrated pest management protocol. Registered use varies by product, but Eco Bran (dry bean, canola, field borders) or Nolo Bait™ (all crops) are both registered for application on field borders and headlands. These bran products need to be spread over the soil surface using a specialized mechanical applicator or valmar and often require repeat applications.

Eco Bran and Nolo Bait™ work via ingestion and require that the grasshoppers consume the product. Following consumption of the bait, grasshoppers typically die in 18 hours to three days (Eco Bran) and three to six weeks (Nolo Bait™). For both products, applications should be made when grasshoppers are small (in the third instar stage) with higher rates needed for larger grasshoppers or denser populations.

Eco Bran contains carbaryl as the insecticide active ingredient and is formulated to not breakdown under UV light for up to 21 days when applied in fields. However, if applied Eco Bran has disintegrated due to rain and is no longer visible in treated areas it will need to be reapplied.

Nolo Bait™ is an organic product comprised of wheat bran coated with spores of the protozoan *Nosema locustae*. Upon ingestion, infection via the protozoa results in sickness of the grasshopper. As the *Nosema locustae* population increases inside the grasshopper it becomes lethargic, reduces its feeding and has lowered reproductive capacity.

Integrated Pest Management

This publication covers insecticide options to manage insect pests. Insecticides are one part of an integrated pest management plan. Planning and including practices that reduce or discourage insect pests is cost-effective management. More information on integrated pest management is available in the references and additional resources at the end of this publication.

An important component of integrated pest management is pest monitoring. Pest monitoring programs are underway each year in Saskatchewan. They are used to create forecast maps, inform research decisions, and monitor for emerging pest issues, as well as guide management and field specific monitoring activities.

Pest monitoring surveys are now permission based. Consider signing up online with the Saskatchewan Ministry of Agriculture's pest monitoring program.

References & Additional Resources

- Saskatchewan Guide to Crop Protection
- Field Heroes
- Grasshoppers in Pulse Crops
- Grasshopper ID Webinar
- Grasshoppers
- Lygus Bug in Pulse Crops
- Pea Aphids in Pulse Crops
- Pea Leaf Weevil in Pulse Crops
- Cabbage Seedpod Weevil
- Diamondback Moth
- Bertha Armyworm
- Flea Beetles
- Pest Monitoring Program
- Wheat Midge
- Wireworm Guide