

CANOLA INSECTS

Other Resources Available Through NDSU Extension Service:

Publications	E1234	Biology and Integrated Pest Management of the Crucifer Flea Beetle in Canola (2002)
	A1280	Canola Production Field Guide (2005)
	E1346	Diamondback Moth in Canola: Biology and Integrated Pest Management (2008)
	E1347	Bertha Armyworm in Canola: Biology and Integrated Pest Management (2008)

BERTHA ARMYWORMS

The Bertha armyworm attacks many kinds of broadleaf plants, including canola, flax and beans. Areas of North Dakota where this insect may be found include the north-central counties of Bottineau, Rollette, Towner, and neighboring areas. The larvae are pale green when they first hatch. These larvae feed on the leaves. Older larvae reach a length of 3/4 to 1 inch and will be velvety brown to black with a yellowish band along each side of the body. As leaves dry, these larvae begin feeding on seeds and flowers which are more succulent. The greatest risk of crop injury occurs in August as the worms approach full growth. In Canada, where this insect is a more frequent pest, early seeded canola often has been swathed prior to the occurrence of significant feeding injury.

Threshold:

Thresholds would be 18 to 22 larvae per square yard, as long as leaf feeding is the extent of the damage observed.

Thresholds may be adjusted lower if larvae are found feeding on maturing seed pods.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
<i>Bacillus thuringiensis</i> For Organic Production	see specific labels for rate recommendations		No preharvest interval. Non-toxic to man or wildlife. Worker Restricted Entry Interval (REI) is 4 hours. Treat when larvae are young (early instars) before crop is damaged. Larvae must be actively feeding on treated, exposed plant surfaces. Under heavy pest population pressure, use the higher label rates, shorten the spray interval (3-14 days), and /or raise spray volume to improve spray coverage. Currently labeled are: Agree®, Biobit®, Condor G®, Dipel®, Javelin®, M-Peril®, MVP®.
bifenthrin Bifenture EC Brigade 2 EC Capture 2 EC Fanfare 2 EC Tundra <i>RUP</i>	0.033 - 0.04	2.1 - 2.6 fl oz	PHI = 35 days. Do not apply more than 5.12 fl oz per acre per season. Do not make applications less than 14 days apart. Apply a minimum of 2 gals. of finished spray per acre by air or in a minimum of 10 gals. per acre by ground. When applying by air, 1 to 2 quarts of emulsified oil may be substituted for 1 to 2 qts of water in the finished spray.
deltamethrin Delta Gold <i>RUP</i>	0.009	0.8 fl oz	Apply a minimum of 2 GPA of water by air and 5 GPA of water by ground. PHI = 7 days. Do not apply more than 1.5 fl oz (0.018 lb ai) per acre per season. Do not make applications less than 7 days apart.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.0075 - 0.015	1.92 - 3.84 fl oz	PHI = 7 days. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.015 - 0.03	1.92 - 3.84 fl oz	PHI = 7 days. Do not apply more than 0.09 lb ai per acre per season. Avoid application when bees are actively foraging. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.015 - 0.03	1.0 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.015 - 0.03	0.96 - 1.92	
tebufenozide Confirm 2F	0.12 - 0.25	8 - 16 fl oz	PHI = 14 days. Do not apply more than 64 fl oz (1 lb ai) per acre per season. Apply in a minimum of 10 GPA by ground and 5 GPA by air.

Canola

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
zeta-cypermethrin Mustang Max EC <i>RUP</i>	0.025	4 fl oz	PHI = 7 days. Do not apply more than 0.15 lb ai per acre per season. Do not make applications less than 7 days apart.

CUTWORMS

Most damage by cutworms occurs during seedling stage. Army cutworm feeding as early as late April has caused problems in recent years for canola growers in southwestern North Dakota. Cutworm damage consists of young plants being chewed off slightly below or at ground level. Some cutworm feeding injury may occur on foliage. Cutworms primarily feed at night. When checking canola fields for cutworms during the day, dig down into soil an inch or two around recently damaged plants; there you can find the gray to gray-brown larva.

Threshold:

Treatment is warranted when one cutworm or more is found per 3 feet of row and the larvae are small (<3/4 inch long).

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
bifenthrin Bifenture EC Brigade 2 EC Capture 2 EC Fanfare 2 EC Tundra <i>RUP</i>	0.033 - 0.04	2.1 - 2.6 fl oz	PHI = 35 days. Do not apply more than 5.12 fl oz per acre per season. Do not make applications less than 14 days apart. Apply a minimum of 2 gals. of finished spray per acre by air or in a minimum of 10 gals. per acre by ground. When applying by air, 1 to 2 quarts of emulsified oil may be substituted for 1 to 2 qts of water in the finished spray.
deltamethrin Delta Gold <i>RUP</i>	0.009	0.8 fl oz	Apply a minimum of 2 GPA of water by air and 5 GPA of water by ground. PHI = 7 days. Do not apply more than 1.5 fl oz (0.018 lb ai) per acre per season. Do not make applications less than 7 days apart.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.0075 - 0.015	1.92 - 3.84 fl oz	PHI = 7 days. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.015 - 0.03	1.92 - 3.84 fl oz	PHI = 7 days. Do not apply more than 0.09 lb ai per acre per season. Avoid application when bees are actively foraging. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.015 - 0.03	1.0 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.015 - 0.03	0.96 - 1.92	
zeta-cypermethrin Mustang Max EC <i>RUP</i>	0.025	4 fl oz	PHI = 7 days. Do not apply more than 0.15 lb ai per acre per season. Do not make applications less than 7 days apart.

RUP - Restricted use pesticide

DIAMONDBACK MOTH

Diamondback moths move to canola, rapeseed and other mustard hosts in late spring and early summer. The first eggs are laid on the lower leaves. The small, greenish larvae make tiny, irregular holes in the leaves. Moths of later generations lay eggs higher on the plant. These hatching larvae feed first on leaves, moving later to buds, flowers and developing seedpods. Foliar damage by diamondback moth larvae looks bad, but significant yield losses are not common. Damage would be much worse when plants are under drought or heat stress.

Threshold:

Treat when larval counts reach 25 to 30 per square foot, or 1 to 2 larvae per plant, and there is significant evidence of damage to flowers and/or pods.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
bifenthrin Bifenture EC Brigade 2 EC Capture 2 EC Fanfare 2 EC Tundra <i>RUP</i>	0.033 - 0.04	2.1 - 2.6 fl oz	PHI = 35 days. Do not apply more than 5.12 fl oz per acre per season. Do not make applications less than 14 days apart. Apply a minimum of 2 gals. of finished spray per acre by air or in a minimum of 10 gals. per acre by ground. When applying by air, 1 to 2 quarts of emulsified oil may be substituted for 1 to 2 qts of water in the finished spray.
deltamethrin Delta Gold <i>RUP</i>	0.009	0.8 fl oz	Apply a minimum of 2 GPA of water by air and 5 GPA of water by ground. PHI = 7 days. Do not apply more than 1.5 fl oz (0.018 lb ai) per acre per season. Do not make applications less than 7 days apart.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.0075 - 0.015	1.92 - 3.84 fl oz	PHI = 7 days. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.015 - 0.03	1.92 - 3.84 fl oz	PHI = 7 days. Do not apply more than 0.09 lb ai per acre per season. Avoid application when bees are actively foraging. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.015 - 0.03	1.0 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.015 - 0.03	0.96 - 1.92	
methyl parathion <i>RUP</i>	0.5	1 pt	PHI = 28 days. Apply using a minimum of 3 GPA. Do not enter treated fields within 48 hours after application. Do not make more than 2 applications per season.
zeta-cypermethrin Mustang Max EC <i>RUP</i>	0.025	4 fl oz	PHI = 7 days. Do not apply more than 0.15 lb ai per acre per season. Do not make applications less than 7 days apart.

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FLEA BEETLES

Flea beetles are the most serious pest of canola in North Dakota. The adult beetles feed on the emerging cotyledon and first true leaves of the young plant. Feeding injury can result in plant death and significant stand loss, especially during hot, dry weather.

Flea beetles overwinter as adults. They become active when temperatures reach 58° F. The beetles fly to canola, rapeseed and other mustards, moving into fields just as the seedlings emerge. The feeding injury appears as holes or small pits in the cotyledons and leaves. Injury can range from a few shot holes to destruction of the entire plant. Flea beetles feed most actively when the weather is sunny, warm and dry. Beetle activity is less when weather conditions are cool and damp. When warm, dry conditions exist and feeding injury is occurring, the plant can be stressed quickly. Cool, damp conditions can reduce the feeding intensity of the beetles and aid plant growth to the point where they can withstand the feeding damage. Once the crop is beyond the seedling stage and the first true leaves are fully expanded, serious damage usually does not occur. By mid-June, adult beetles decrease in number.

Flea Beetle Management:

Early Planting . . . The early planting and establishment of canola can prevent significant injury to young plants by flea beetles migrating to fields after the first true leaves are fully expanded.

Seed Treatment . . . Gaucho®, Helix®, Poncho® and Prosper® are for use by commercial seed treaters.

Foliar Treatment . . . Fields should be checked daily for the presence of flea beetles while canola plants are at risk. The treatment threshold is when injury is approaching 25% and beetles are present. Foliar treatments must be made quickly. The weakness of foliar control strategies is the inability to cover large number of acres quickly when feeding pressure is high, and residual protection by the insecticides is short, allowing for reinfestation to occur.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
bifenthrin Bifenture EC Brigade 2 EC Capture 2 EC Fanfare 2 EC Tundra <i>RUP</i>	0.033 - 0.04	2.1 - 2.6 fl oz	PHI = 35 days. Do not apply more than 5.12 fl oz per acre per season. Do not make applications less than 14 days apart. Apply a minimum of 2 gals. of finished spray per acre by air or in a minimum of 10 gals. per acre by ground. When applying by air, 1 to 2 quarts of emulsified oil may be substituted for 1 to 2 qts of water in the finished spray.
clothianidin NipsIT INSIDE (seed treatment)	refer to recommended label rate	10.23 fl oz per 100 lbs seed	Application to seed by commercial seed treatment equipment utilizing standard liquid or slurry treaters is necessary. Tank mixtures with other seed treatment products should be pretested to evaluate compatibility and assure proper physical compatibility.
clothianidin Poncho Prosper (fungicide premix)		3.84 - 10.23 fl oz per 100 lbs of seed 19.2 - 25.6 fl oz per 100 lbs of seed	For use in commercial seed treaters only. Not for use in hopper-box, slurry-box or other seed treatment applications at, or immediately before, planting. Provides protection from flea beetle feeding injury. Rates can be varied depending on assessment of flea beetle risk based on population size observed.
deltamethrin Delta Gold <i>RUP</i>	0.009	0.8 fl oz	Apply a minimum of 2 GPA of water by air and 5 GPA of water by ground. PHI = 7 days. Do not apply more than 1.5 fl oz (0.018 lb ai) per acre per season. Do not make applications less than 7 days apart.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.0075 - 0.015	1.92 - 3.84 fl oz	PHI = 7 days. When applying by air, apply in a minimum of 2 gals water/acre.
imidacloprid Gaucho 600		10.24 - 25.6 fl oz per hundredweight of seed	Primarily for use in commercial seed treaters. Canola seed may be treated as an end-use seed treatment on agricultural establishments at, or immediately before planting, using a liquid or slurry treatment device. Provides protection from flea beetle feeding injury. Rates can be varied depending on assessment of flea beetle risk based on population size observed.
imidacloprid Attendant 600 Dyna-Shield Imidacloprid 5 Senator 600	refer to recommended label rate		Apply as a commercial seed treatment or for end-use at agricultural establishments (total slurry treater, farmer applied seed treater). To provide early season protection of seedlings against injury by aphids, flea beetles and wireworms. Follow all applicable directions, restrictions and precautions on the EPA registered label.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.015 - 0.03	1.92 - 3.84 fl oz	PHI = 7 days. Do not apply more than 0.09 lb ai per acre per season. Avoid application when bees are actively foraging. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.015 - 0.03	1.0 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.015 - 0.03	0.96 - 1.92	
methyl parathion <i>RUP</i>	0.5	1 pt	PHI = 28 days. Apply using a minimum of 3 GPA. Do not enter treated fields within 48 hours after application. Do not make more than 2 applications per season.

Canola

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
thiamethoxam Helix (10.3 % active) Helix Xtra (20.7% active)		23 fl oz per hundredweight of seed	For use in commercial seed treaters only. The formulations vary by the concentration of insecticide. Provides protection from flea beetle feeding injury. Helix contains 3 fungicides to protect against seed-borne blackleg, seed-borne <i>Alternaria</i> , and the seedling disease complex disease. There is a 30 day plant-back restriction.
zeta-cypermethrin Mustang Max EC <i>RUP</i>	0.025	4 fl oz	PHI = 7 days. Do not apply more than 0.15 lb ai per acre per season. Do not make applications less than 7 days apart.

RUP - Restricted use pesticide

GRASSHOPPERS

Thresholds:

Grasshopper control is advised whenever 20 or more adults per square yard are found in field margins or 8 to 14 adults per square yard are occurring in the crop. (For more information on infestation ratings, see the discussion under Grasshoppers in Small Grain Insects).

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
bifenthrin Bifenture EC Brigade 2 EC Capture 2 EC Fanfare 2 EC Tundra <i>RUP</i>	0.033 - 0.04	2.1 - 2.6 fl oz	PHI = 35 days. Do not apply more than 5.12 fl oz per acre per season. Do not make applications less than 14 days apart. Apply a minimum of 2 gals. of finished spray per acre by air or in a minimum of 10 gals. per acre by ground. When applying by air, 1 to 2 quarts of emulsified oil may be substituted for 1 to 2 qts of water in the finished spray.
deltamethrin Delta Gold <i>RUP</i>	0.009	0.8 fl oz	Apply a minimum of 2 GPA of water by air and 5 GPA of water by ground. PHI = 7 days. Do not apply more than 1.5 fl oz (0.018 lb ai) per acre per season. Do not make applications less than 7 days apart.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.0075 - 0.015	1.92 - 3.84 fl oz	PHI = 7 days. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.015 - 0.03	1.92 - 3.84 fl oz	PHI = 7 days. Do not apply more than 0.09 lb ai per acre per season. Avoid application when bees are actively foraging. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.015 - 0.03	1.0 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.015 - 0.03	0.96 - 1.92	
zeta-cypermethrin Mustang Max EC <i>RUP</i>	0.025	4 fl oz	PHI = 7 days. Do not apply more than 0.15 lb ai per acre per season. Do not make applications less than 7 days apart.

RUP - Restricted use pesticide

LYGUS BUGS (TARNISHED PLANT BUGS)

Lygus bugs are comprised of several species belonging to the genus *Lygus*. The tarnished plant bug, *Lygus lineolaris*, is one of the more common species and is known to feed on over 200 host plants. Adult Lygus bugs are about ¼ inch in length, and pale green, light brown, or dark brown with a distinctive triangular marking on its back. Lygus bugs overwinter as adults in weedy areas and move into canola fields throughout the season. Adults lay eggs in the stems, leaves, and flowers of host plants, and then die. Immature nymphs hatch from these eggs. These nymphs are small, green, and sometimes confused with aphids; although Lygus nymphs are very active and move rapidly when disturbed, while aphids do not. Several generations occur each year with the second generation occurring in late July to early August. Hot dry weather favors the buildup of Lygus populations and increases the risk of

damage to the canola crop. Both immature and adult Lygus bugs feed on growing points, buds, flowers, and green pods. Lygus bugs inject a toxic saliva with their piercing sucking mouthparts during feeding, causing blasting of flowers or buds and shriveled seeds. Blasted flowers turn white within 24 hours and quickly fall to the ground. The small seeds or damaged seeds are lost during harvest.

Thresholds:

Scout for Lygus bugs from just prior to bud formation until seeds within the pod have become firm. Lygus populations can increase suddenly. For example, when an alfalfa (preferred host) is cut, Lygus will migrate quickly into nearby canola fields and often in high numbers. Use a 15-inch sweep net and make 10 180-degree sweeps at several sampling sites. The economic thresholds developed in Canada are: 15 Lygus bugs per 10 sweeps from bud stage through petal drop, and 20 Lygus bugs per 10 sweeps after petal drop. If soil moisture is good, canola plants usually can compensate for Lygus bug feeding injury to plants in the bud and flowering stages. However, if populations are high, control during the early pod ripening stage is usually the most economical.

INSECTICIDE	DOSAGE IN LB AI/ACRE	PRODUCT PER ACRE	RESTRICTIONS ON USE
bifenthrin Bifenture EC Brigade 2 EC Capture 2 EC Fanfare 2 EC Tundra <i>RUP</i>	0.033 - 0.04	2.1 - 2.6 fl oz	PHI = 35 days. Do not apply more than 5.12 fl oz per acre per season. Do not make applications less than 14 days apart. Apply a minimum of 2 gals. of finished spray per acre by air or in a minimum of 10 gals. per acre by ground. When applying by air, 1 to 2 quarts of emulsified oil may be substituted for 1 to 2 qts of water in the finished spray.
deltamethrin Delta Gold <i>RUP</i>	0.009	0.8 fl oz	Apply a minimum of 2 GPA of water by air and 5 GPA of water by ground. PHI = 7 days. Do not apply more than 1.5 fl oz (0.018 lb ai) per acre per season. Do not make applications less than 7 days apart.
gamma-cyhalothrin Proaxis <i>RUP</i>	0.0075 - 0.015	1.92 - 3.84 fl oz	PHI = 7 days. When applying by air, apply in a minimum of 2 gals water/acre.
imidacloprid Dyna-Shield Imidacloprid 5 Senator 600 (for suppression of second generation Lygus bugs)	refer to recommended label rate		Apply as a commercial seed treatment or for end-use at agricultural establishments (total slurry treater, farmer applied seed treater). To provide early season protection of seedlings against injury by aphids, flea beetles and wireworms. Follow all applicable directions, restrictions and precautions on the EPA registered label.
lambda-cyhalothrin Lambda-Cy Silencer Grizzly Z <i>RUP</i>	0.015 - 0.03	1.92 - 3.84 fl oz	PHI = 7 days. Do not apply more than 0.09 lb ai per acre per season. Avoid application when bees are actively foraging. When applying by air, apply in a minimum of 2 gals water/acre.
lambda-cyhalothrin Kaiso 24 WG <i>RUP</i>	0.015 - 0.03	1.0 - 2.0 oz	
lambda-cyhalothrin Warrior II <i>RUP</i>	0.015 - 0.03	0.96 - 1.92	
zeta-cypermethrin Mustang Max EC <i>RUP</i>	0.025	4 fl oz	PHI = 7 days. Do not apply more than 0.15 lb ai per acre per season. Do not make applications less than 7 days apart.

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