OKLAHOMA COOPERATIVE EXTENSION SERVICE CR-7667
Rev. 0817
Current Report

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Management of Insect and Mite Pests in Canola

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There are several arthropod pests that damage canola sporadically throughout the region. Pesticides should not be a substitute for good agronomic practices or as "preventative insurance" because it can cause pest resurgence issues and is rarely economically or environmentally justifiable. Many canola pest problems can be managed by following good cultural practices, such as selecting varieties that are adapted to Oklahoma growing conditions, planting at an optimal date and providing proper fertilization and good weed control.

The information herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Pesticide recommendations in this publication were correct as of the "Modified Date" but always check the label that came with the purchased insecticide for the most current rates and restrictions

The first name listed is the trade name of a product registered for use in corn for the listed pest. The name in (parentheses) listed below the trade name is the name of the active ingredient. The active ingredient name is provided because in many cases, there are other registered products containing the same active ingredient that may cost less, so producers should compare prices.

The number [in brackets] following a product is its Mode of Action number [MOA]. The more frequently insecticides with the same MOA are used, the more likely resistance will occur. This number provides an easy way to select different modes of action to avoid selecting for pests that are resistant to a certain mode of action.

Refer to the following publications for additional information on pest management in canola.

BAE-1110	Storing Oklahoma Winter Canola
CR-2133	Crop and Forage Recordkeeping Software
CR-2144	2015-2016 Winter Canola Performance Trials
EPP-7085	Pest Management Needs Assessment for Oklahoma Canola Producers
EPP-7089	Caterpillars in Canola
EPP-7095	Sclerotinia Stem Rot of Canola
EPP-7196	Grasshopper Management in Rangeland, Pastures, and Crops
EPP-7671	Black Leg of Canola
PSS-2130	Managing Winter Canola in Oklahoma
PSS-2131	Winter Canola Planting Guide for the Southern Great Plains
PSS-2150	Winter Canola Cultivar Comparison Chart

An additional source of information is MF-2734, "Great Plains Canola Production Handbook", is a joint publication of Kansas State University, Oklahoma State University and the University of Nebraska. It is available by contacting the following website: www.oznet.ksu.edu

Management of Insect and Mite Pests in Canola

Pest, Damage and Treatment Threshold	*Insecticide, Formulation, [MOA Group] and (Active Ingredient)*	*Rate of Product and (lb active ingredient) per Acre*	*Comments*
Aphids	**Planting Time**		Research data indicates that aphids are a consistent pest of winter canola in fall and winter. The use of seed treatments is highly recommended for early-season management of aphids. Additional foliar insecticide applications may be necessary for late-season control of aphids. Green peach aphid is known to have resistance to pyrethroid [MOA group 3] insecticides. Products that contain these active ingredients that are bundled with fungicides are available.
Cabbage aphid: small blue-gray aphid with short cornicles, and is usually covered with a powdery wax secretion.	Gaucho 600 [4A] (imidacloprid)	10.24 to 25.6 fl oz/cwt seed	
	Helix EXtra [4A] (thiamethoxam)	23 fl oz/cwt seed	
Green peach aphid: Pale green to yellow (sometimes pink) with long cornicles and three dark lines on abdomen.	Poncho [4A] (clothianidin)	3.84 to 10.23 fl oz./cwt seed	
Turnip aphid: Pale gray green with short, swollen cornicles, 1/16 inches. Winged adults can be recognized by presence of transverse dark bands on last two abdominal segments.	**Post-Plant**		
	Azadirachtin [UN]	1 pt.	No PHI for harvest (Aza-direct, Ecozin).
	Besiege [28,3] (chlorantraniliprole + lambda-cyhalothrin)	10 fl oz.	Label for cabbage aphid only; 21-day PHI.

Pest, Damage and Treatment Threshold	*Insecticide, Formulation, [MOA Group] and (Active Ingredient)*	*Rate of Product and (lb active ingredient) per Acre*	*Comments*
Aphids (cont'd) Damage: High populations can cause stunting and discoloration of leaves. Feeding by cabbage aphid can stop terminal growth and reduce yield. Damage is of little consequence after pod formation is completed. Threshold Treat rosette stage plants only when aphids exceed 100 to 200 per plant. Treat bud and early bloom stage when infested plants (racemes) exceed 15%. Don't treat at late flower or pod stage.	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Annex, Bifenture, Discipline, Empower, Fanfare, Sniper).
	Carbine 50 WG [29] (flonicamid)	2.8 oz. (0.089 lb. ai)	7-day PHI, Apply before aphids reach high levels (Beleaf is also registered for rapeseed).
	Grandevo (Chromobacterium substsugae)	2 to 3 lb./A	0-day PHI.
	Hero [3] (zeta-cypermethrin + bifenthrin)	4.0 to 5.5 fl oz. (0.04 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Karate/Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz. (0.03 lb. ai)	7-day PHI for harvest or grazing.
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	4.5 to 5.95 fl oz (0.04 to 0.053 lb ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz (0.025 lb ai/A)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	3.84 fl oz (0.015 lb. ai)	7-day PHI for harvest or grazing.
	Transform WG [4C] (sulfoxaflor)	0.5 to 0.75 oz (0.016 to 0.023 lb ai/A)	7-day PHI. Must apply only after petal fall.
Army cutworm Gray striped caterpillar that curls up in to a tight "C" when disturbed. Evident from January through March Damage: Cuts plants at soil line, can kill plants if it eats the growing point. Threshold: 1-2 per foot of row.	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Annex, Bifenture, Discipline, Empower, Fanfare, Sniper).
	Fortenza [28] (cyantraniliprole)	7.7 fl oz/cwt seed	Seed treatment.
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	2.8 to 5.95 fl oz. (0.025 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz. (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing.
	Lumiderm [28] (cyantraniliprole)	3.7 to 24.6 fl oz/cwt (0.15 to 1.0 lb.)	Seed treatment.
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.84 fl oz. (0.0075 to 0.015 lb ai/A)	7-day PHI for harvest or grazing.
Beet/Fall Armyworm Beet armyworm: Green caterpillar, darker above with a white stripe along the side of the body and a small black spot above the second pair of true legs, three pairs of true (thoracic legs) and four pair of abdominal prolegs. Fall armyworm: Brown, green, or largely black striped caterpillar, up to 1.5 inches, with a light-colored inverted "Y" on head.	Azadirachtin [UN]	Apply per label.	No PHI for harvest (Aza-direct, Ecozin).
	B. thuringiensis [11]	Apply per label.	No PHI for harvest (Dipel. Javelin, Leipnox, Xentari).
	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz. (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Bifenture, Discipline, Empower, Fanfare, Sniper, Tailgunner, Tundra).
	Confirm 2F [18] (tebufenozide)	8 to 16 fl oz. (0.12 to 0.25 lb. ai)	14-day PHI.

Pest, Damage and Treatment Threshold	*Insecticide, Formulation, [MOA Group] and (Active Ingredient)*	*Rate of Product and (lb active ingredient) per Acre*	*Comments*
Beet/Fall Armyworm (cont'd) Damage: Caterpillars can reduce seedling stand and chew conspicuous, irregular-shaped holes in leaves. Threshold: Seedling, treat when scouting indicates 1 or more per row-ft. Treat when defoliation becomes severe, and larvae are present.	Delta Gold 1.5 EC [3] (deltamethrin)	0.8 fl oz. (0.009 lb. ai)	7-day PHI.
	Grandevo (*Chromobacterium substsugae*)	1 to 3 lb./A	0 Day PHI.
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	4.5 to 5.95 fl oz. (0.04 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz. (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: (Karate, Grizzly Z, Lambda Cy, Lamcap, Paradigm, Province, Silencer).
	Mustang MAX EC [3] (zeta-cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Prevathon [28] (chlorantraniliprole)	14 to 20 fl oz. (0.047-0.067 lb. ai)	1-day PHI. While beet/fall armyworms are not specifically listed on the label, Coragen and Prevathon is labeled for use in canola, and can be applied under the 2ee label at the listed rate, which is labeled for beet/fall armyworm on other crops. However, since these pests are not specifically named in canola recommendations, the user assumes all responsibility for the application and results.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.84 fl oz. (0.0075 to 0.015 lb. ai)	7 Day PHI for harvest or grazing.
Cabbage looper Green caterpillar, with a thin white line along each side of the body, three pairs of thoracic legs and three pair of abdominal prolegs. Damage: Caterpillars chew conspicuous, irregular-shaped holes in leaves. Threshold: Treat when defoliation becomes severe, and larvae are present.	Azadirachtin [UN]	Apply per label.	No PHI for harvest.
	B. thuringiensis [11A]	Apply per label.	No PHI for harvest.
	Besiege [28,3] (chlorantraniliprole + lambda-cyhalothrin)	5.0 to 10.0 fl oz.	21-day PHI.
	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz. (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Annex, Bifenture, Discipline, Empower, Fanfare, Sniper).
	Exirel [28] (cyantraniliprole)	10 to 20.5 fl oz (0.065 to 0.133 lb. ai)	7 day PHI for harvest, label recommends using an adjuvant.
	Grandevo (Chromobacterium substsugae)	1-3 lb./A	0-day PHI.
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	4.5 to 5.95 fl oz. (0.04 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz. (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: (Karate, Grizzly Z, Lambda Cy, Lamcap, Paradigm, Province, Silencer).
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.84 fl oz. (0.0075 to 0.015 lb. ai)	7 Day PHI for harvest or grazing.

Pest, Damage and Treatment Threshold	*Insecticide, Formulation, [MOA Group] and (Active Ingredient)*	*Rate of Product and (lb active ingredient) per Acre*	*Comments*
Diamondback moth Adult moths are light grayish-brown with a white diamond-shaped marking along back when wings are folded. Larvae are slightly tapered at each end and pale green in color. Wriggle rapidly when disturbed. Damage: Larvae feed on all plant parts, preferring the undersides of older leaves. Threshold: No threshold has been established.	Azadirachtin [UN]	Apply per label.	No PHI for harvest (Aza-direct, Ecozin).
	B. thuringiensis [11]	Apply per label.	No PHI for harvest (Dipel. Javelin, Leipnox, Xentari).
	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz. (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Bifenture, Discipline, Empower, Fanfare, Sniper, Tailgunner, Tundra).
	Coragen [28] (chlorantraniliprole)	3.5 to 7.5 fl oz. (0.045 to 0.098 lb. ai)	1-day PHI for harvest.
	Delta Gold 1.5 EC [3] (deltamethrin)	0.8 fl oz. (0.009 lb. ai)	7-day PHI.
	Exirel [28] (cyantraniliprole)	7 to 13.5 fl oz (0.045 to 0.088 lb. ai)	7-day PHI for harvest, label recommends using an adjuvant.
	Grandevo (*Chromobacterium substsugae*)	1 to 3 lb./A	0 Day PHI.
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	4.5 to 5.95 fl oz. (0.04 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz. (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: (Karate, Grizzly Z, Lambda Cy, Lamcap, Paradigm, Province, Silencer).
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Prevathon [28] (chlorantraniliprole)	14.0 to 20 fl oz. (0.047-0.067 lb. ai)	21-day PHI.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.84 fl oz. (0.0075 to 0.015 lb. ai)	7-day PHI for harvest or grazing.
			Diamondback moth is known for developing resistance to many insecticides, especially pyrethroids (Class3 MOA), therefore thorough field scouting and class rotation of insecticides is encouraged.
False chinch bug Adults 1/8 inch, long dirty gray, with brown or black markings, piercing mouthparts. Damage: Feed in groups. Large numbers may cause wilting of heads or small plants. Threshold: Flowering: Treat when there is an AVERAGE of 20 to 30 per head. Early seed pod: Treat when there is an AVERAGE of 40 to 50 per head.	Azadirachtin [UN]	Apply per label.	No PHI for harvest.
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	4.5 to 5.95 fl oz. (0.04 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	3.84 fl oz	7-day PHI for harvest or grazing.
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: Karate, Grizzly Z, Lambda Cy, Silencer, Tiaga).
			False chinch bugs thrive in hot, dry conditions which makes it more difficult to control them. They are not specifically named on these labels, but can be used at the rates listed. For best results, use highest levels of water carrier for thorough coverage.

Pest, Damage and Treatment Threshold	*Insecticide, Formulation, [MOA Group] and (Active Ingredient)*	*Rate of Product and (lb active ingredient) per Acre*	*Comments*
Flea beetle Shiny black beetle about 1/16 inch long, jumps when disturbed. Damage: Early spring. Feeding damage results in plant tissue that is scraped from leaf and/or small holes chewed in leaves. Can cause delayed development in cool growing conditions. Threshold: No threshold has been established.	**Planting Time**		
	DynaShield [4A] (imidacloprid)	10.24 to 25.6 fl oz./cwt seed	Harvested seed can only be used for industrial purposes, not for edible oil.
	Fortenza [28] (cyantraniliprole)	20.4 fl oz/cwt seed	Check labels of seed treatments for crop rotation restrictions. They range from 0 days to 12 months, depending on the insecticide and crop.
	Helix EXtra [4A] (thiamethoxam)	23 fl oz./cwt seed	
	Poncho [4A]	3.84 to10.23 fl oz./cwt	
	Post-Plant		
	Azadirachtin [UN]	Apply per label.	No PHI for harvest.
	Brigade 2EC [3]	2.1 to 2.6 fl oz.	35-day PHI for harvest. (other names: Bifenture, Tundra).
	Delta Gold 1.5 EC [3] (deltamethrin)	0.8 fl oz. (0.009 lb. ai)	7-day PHI.
	Hero [3] (zeta-cypermethrin + bifenthrin)	2.6 to 5.5 fl oz. (0.025 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz. (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: (Karate, Grizzly Z, Lambda Cy, Lamcap, Paradigm, Province, Silencer).
	Mustang MAXX EC [3] (zeta cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.84 fl oz. (0.0075 to 0.015 lb. ai)	7-day PHI for harvest or grazing.
Harlequin bug Black shield-shaped with orange, red and yellow markings. Measures 3/8-inch long. Eggs barrel shaped and laid in clusters. Damage: Adults and nymphs pierce stalks, leaves with sucking mouthparts. Threshold: No threshold has been established.	Azadirachtin (un)	Apply per label.	No PHI for harvest.
	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz. (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Bifenture, Discipline, Empower, Fanfare, Sniper, Tailgunner, Tundra)
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	4.5 to 5.95 fl oz. (0.04 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz. (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: (Karate, Grizzly Z, Lambda Cy, Lamcap, Paradigm, Province, Silencer).
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.

Pest, Damage and Treatment Threshold	*Insecticide, Formulation, [MOA Group] and (Active Ingredient)*	*Rate of Product and (lb active ingredient) per Acre*	*Comments*
Grasshopper 1-2 inches, outer wings leathery, inner wings clear or colored. Enlarged hind legs designed for jumping. Damage: Chew leaves. Leaves may have ragged edges or leaf blade may be completely chewed. Small plants may be killed. Threshold: 15-20 per square yard. If nymph populations exceed threshold field borders (25 to 40 per square yard), treat before they move into canola. See EPP-7196: Grasshopper Management in Rangeland, Pastures, and Crops	Besiege [28,3] (chlorantraniliprole + lambda-cyhalothrin)	5 to 10 fl oz.	21-day PHI.
	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Annex, Bifenture, Discipline, Empower, Fanfare, Sniper).
	Coragen [28] (chlorantraniliprole)	2.0 to 5.0 fl oz (0.026 to 0.065 lb. ai)	1-day PHI.
	Delta Gold 1.5 EC [3] (deltamethrin)	0.8 fl oz. (0.009 lb.ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Hero EW [3] (zeta-cypermethrin + bifenthrin)	4.5 to 5.95 fl oz. (0.04 to 0.053 lb. ai)	35-day PHI for harvest (Steed is another mixture of the same active ingredients).
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.84 fl oz. (0.0075 to 0.015 lb. ai)	7-day PHI for harvest or grazing.
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: Karate, Grizzly Z, Lambda Cy, Silencer, Tiaga).
Lygus bug Several species. Generally oval, about ¼ inch long, brown with some yellow or reddish markings. Damage: Feed on developing seeds, flowers, and leaves. Feed on buds. Thresholds are for infestations before or during petal fall. Threshold: North Dakota thresholds are 15 per 10 sweeps before petal fall, and 20 per 10 sweeps after petal fall.	Azadirachtin (UN)	Apply per label	No PHI for harvest (Aza-direct, Ecozin).
	Brigade 2EC [3] (bifenthrin)	2.1 to 2.6 fl oz. (0.033 to 0.04 lb. ai)	35-day PHI for harvest. (other names: Bifenture, Discipline, Empower, Fanfare, Sniper, Tailgunner, Tundra).
	Delta Gold 1.5 EC [3] (deltamethrin)	0.8 fl oz. (0.009 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Karate/Warrior II [3] (lambda-cyhalothrin)	0.96 to 1.92 fl oz. (0.015 to 0.03 lb. ai)	7-day PHI for harvest or grazing (other names: (Karate, Grizzly Z, Lambda Cy, Lamcap, Paradigm, Province, Silencer).
	Mustang MAXX EC [3] (zeta-cypermethrin)	4.0 fl oz. (0.025 lb. ai)	7-day PHI for harvest. Do not make applications less than seven days apart.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.84 fl oz. (0.0075 to 0.015 lb. ai	7 Day PHI for harvest or grazing.
White grub Large, "C" shaped grub with a white body and a brown head. Damage: Grubs feed on roots of seedling plants. Damage potential is dependent on planting date and speed of growth of the plant. Threshold: Seed treatments are registered for protection against early season damage Treat if field history indicates a problem.	**Planting Time**		Do not use treated seed for feed, food or oil purposes.
	DynaShield [4A] (imidacloprid)	10.24 to 25.6 fl oz/cwt seed	Harvested seed can only be used for industrial purposes, not for edible oil.
	Helix EXtra [4A] (thiamethoxam)	23 fl oz/cwt seed	30 post-harvest waiting period for planting all crops except winter wheat.
	Poncho [4A] (clothianidin)	3.84-10.23 fl oz/cwt seed	30 post-harvest waiting period for planting all crops except corn.

Pest, Damage and Treatment Threshold	*Insecticide, Formulation, [MOA Group] and (Active Ingredient)*	*Rate of Product and (lb active ingredient) per Acre*	*Comments*
Wireworm Hard-shelled, smooth, cylindrical, yellowish to brown worms. 2- to 6-year life cycle. Damage: Feed on seed, seedling. Cause stand loss. Threshold: Seed treatments are registered for protection against early season damage. Treat if field history indicates a problem.	Planting Time		Do not use treated seed for feed, food or oil purposes.
	DynaShield [4A] (imidacloprid)	10.24 to 25.6 fl oz/cwt seed	Harvested seed can only be used for industrial purposes, not for edible oil.
	Helix EXtra [4A] (thiamethoxam)	23 fl oz/cwt seed	30 post-harvest waiting period for planting all crops except winter wheat.
	Poncho [4A] (clothianidin)	3.84-10.23 fl oz/cwt seed	May plant field immediately with corn, or canola. 30 post-harvest waiting period for cereal grains, grasses soybeans and dried beans. Four-month waiting period for all other crops.

Pre-harvest Intervals and grazing restrictions

Azadirachtin (neem)	0-day PHI for harvest
Bacillus thuringiensis	0-day PHI for harvest.
Besiege	21-day PHI
Brigade	35-day PHI for harvest.
Carbine	7-day PHI for harvest
Coragen	1-day PHI for harvest
Delta Gold	7-day PHI for harvest
DynaShield	Harvested seed can only be used for industrial purposes, not for edible oil.
Exirel	7-day PHI for harvest
Fortenza	Crop rotation restrictions vary with crop
Grandivo	0-day PHI
Hero EW	35-day PHI for harvest
Helix EXtra	No PHI listed. Do not graze
Karate/Warrior	30-day PHI for harvest or grazing
Lumiderm	Crop rotation restrictions vary with crop
Mustang MAXX	7-day PHI for harvest
Prevathon	21-day PHI
Prosper FX	No PHI listed
Proaxis	7 Day PHI for harvest or grazing

*** Group numbers in brackets [#] after the insecticide name are used to designate the mode of action of the insecticide according to the classification system developed by the Insecticide Resistance Action Committee, (IRAC) in 2011. It is intended to help in the selection of insecticides for preventative resistance management. If you make multiple applications for a specific pest during a growing season, simply select a registered insecticide with a different number for each application. To further delay resistance from developing, integrate other control methods into your pest management programs**

The pesticide information presented in this publication was current with federal and state regulations at the time of revision. READ and FOLLOW all LABEL directions.

The Oklahoma Cooperative Extension Service
Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 42 cents per copy. Revised 0817 GH.

CR-7667.8