



Current Report

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Management of Insect and Mite Pests in Corn

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Arthropod pests of corn are varied, and often difficult to manage. Many corn pest problems can be avoided by implementing an Integrated Pest Management (IPM) plan that includes preventive pest management practices, such as selecting varieties adapted to Oklahoma growing conditions, planting at an optimal date, proper fertilization and irrigation, and using crop rotations. The application of insecticides, while sometimes necessary, should not be used as a substitute for good agronomic practices or as "preventative insurance" because it is rarely economically or environmentally justifiable.

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 corn pest management.

- AGEC-203 Estimating Yield and Economic Returns from Replanting Corn
- CR-2105 National Corn Handbook: Aflatoxins and other Mycotoxins
- EPP-7160 Field Key to Larvae in Corn
- EPP-7196 Grasshopper Management in Rangeland, Pastures, and Crops

Management of Insect and Mite Pests in Corn

Pest, Damage and Treatment Threshold	Insecticide Formulation and [Group]* and (active ingredient)	Rate of Product per Acre or 1,000 ft-row	Comments
Armyworm 1 to 1.5 inches. Dark green or brown caterpillar with 5 stripes along a smooth body. Head with honeycomb-like markings.	Ambush/Pounce 25WP [3] (permethrin)	6.4 to 12.8 oz (0.1 to 0.2 lb ai/A)	30-day waiting period.
	Asana XL [3] (esfenvalerate)	5.8 to 9.6 fl oz (0.03 to 0.05 lb ai/A)	21-day waiting period.
<u>Damage:</u> Armyworms present throughout growing season, but natural enemies have large impact on them.	<i>Bacillus thuringiensis</i> [11] (Biobit, Condor, Dipel, Lepinox, Javelin, Xentari)	See product label for specific rates.	Check label for waiting periods.
<u>Threshold:</u> Treat if 30% of plants (seedling to 6 extended leaves) are infested, or when 75% of plants are infested with one or more larvae on larger plants.	Baythroid XL [3] (beta-cyfluthrin)	1.6 to 2.8 fl oz (0.013 to 0.022 lb ai/A)	21-day wait for grain or fodder, 0-day for green forage.
	Besiege[28,3] (chlorantraniliprole + lambda cyhalothrin)	6.0 to 10.0 fl oz/A	21-day wait for harvest.
	Blackhawk [5] (spinosad)	1.67 to 3.3 fl oz (0.038 to 0.075 lb ai/A)	1-day PHI for grain, 7-day wait for grazing, 28 days for fodder.
	Cobalt [1B, 3] (chlorpyrifos + gamma-cyhalothrin)	13 to 26 fl oz	21-day wait for harvest, 14 days for grazing or silage.
	Coragen [28] (chlorantraniliprole)	3.5 to 7.5 fl oz (0.045 to 0.098 lb ai/A)	14-day waiting period for harvest 1 day for forage, silage, stover.
	Delta Gold [3] (deltamethrin)	1.5 to 1.9 fl oz (0.018 to 0.022 lb ai/A)	21-day wait for harvest, 14 days for grazing or silage.
	Fastac [3] (alpha-cypermethrin)	3.2 to 3.8 fl oz (0.020 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
	Hero [3] (zeta-cypermethrin + bifenthrin)	4.0 to 10.3 fl oz	0-day wait for green forage, 21 days for harvest or fodder.
	Intrepid 2F [18] (methoxyfenozide)	4 to 16 fl oz (0.06 to 0.25 lb ai/A)	21-day waiting period.
	Karate w Zeon [3] (lambda-cyhalothrin)	1.28 to 1.92 fl oz (0.02 to 0.03 lb ai/A)	3-day wait for forage, 21 days for harvest or grazing.
	Lannate LV [1A] (methomyl)	0.75 to 1.5 pt (0.225 to 0.45 lb ai/A)	35-day waiting period.
Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1.0 lb ai/A)	30-day wait for grain, 60 days for silage.	
Match-Up [1B,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	30-day wait for grain or harvest.	
Mustang MAXX EC [3] (zeta-cypermethrin)	3.2 to 4.0 fl oz (0.02 to 0.025 lb ai/A)	14-day waiting for harvest.	
Proaxis 0.5 SC [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	0-day waiting period.	
Radiant SC [5] (spinetoram)	3.0 to 6.0 fl oz (0.023 to 0.047 lb ai/A)	28-day wait for harvest, 3 days for forage or fodder.	

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Armyworm (cont'd)	Sevin XLR [1A] (carbaryl)	1 to 2 qt (1.5 to 2 lb ai/A)	30-day wait for harvest, 60 days for grazing or silage.
	Stallion [1B,3] (chlorpyrifos + zeta cypermethrin)	9.25 to 11.75 fl oz	
	Voliam Xpress [3, 28] (lambda-cyhalothrin + chlorantraniloprole)	6.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.
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Chinch bug Nymphs are bright red with white band across back. Adults ½ inches, black with white “hour glass” shape on back <u>Damage:</u> Adults may fly into field, early (March to April) or adults and nymphs move in to corn from maturing wheat fields (April-May). Remove plant juices, cause stunting, wilting and reddening of leaves. <u>Threshold:</u> Plants are less than 6 inches: 2 or more chinch bugs on 20% of plants Plants are 6 to 18 inches: 10 or more chinch bugs on 75% of plants.	<u>Seed Treatments:</u>		
	Cruiser 5FS [4A] (thiamethoxam)	1.13 to 3.61 fl oz / 80,000 seed	Do not feed treated seed. Generally must order through a seed dealer.
	Gaucho 600 [4A] (imidacloprid)	2.7 to 6.0 fl oz/ 80,000 seed	Do not feed treated seed. See label for mixing and handling instructions. Follow all label restrictions.
	Poncho 600 [4A] (clothianidin)	1.13 to 2.26 fl oz/ 80,000 seed	Do not feed treated seed. See label for mixing and handling instructions. Follow all label restrictions.
	<u>Planting Time Applications</u>		
	Force CS [3] (tefluthrin)	0.46 to 0.57 fl oz/ 1,000 ft row	T-band application. Read label carefully for restrictions.
	<u>Post-emergence Sprays</u>		Border sprays (30-60 ft) are often effective. Best control is obtained when insecticide is applied by ground, with nozzles directed at the base of the plants using a minimum of 20 to 30 gallons of water.
	Asana XL [3] (esfenvalerate)	5.8 to 9.6 fl oz (0.03 to 0.05 lb ai/A)	21-day waiting period.
	Baythroid XL [3] (beta-cyfluthrin)	1.6 to 2.8 fl oz (0.013 to 0.022 lb ai/A)	21-day waiting period for grain or fodder, 0 day for green forage.
	Brigade 2EC [3] (bifenthrin)	2.1 to 6.4 fl oz (0.033 to 0.1 lb ai/A)	30-day waiting period.
	Cobalt [1B, 3] (chlorpyrifos + gamma-cyhalothrin)	19 to 38 fl oz	21-day wait for harvest, 14 days for grazing or silage.
	Delta Gold [3] (deltamethrin)	1.5 to 1.9 fl oz (0.018 to 0.022 lb ai/A)	21-day wait for harvest, 12 days for grazing or silage.
	Fastac [3] (alpha-cypermethrin)	3.2 to 3.8 fl oz (0.02 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
	Hero [3] (zeta-cypermethrin + bifenthrin)	4.0 to 10.3 fl oz	30-day wait for grain, 60 days for silage.
	Karate w Zeon [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	21-day waiting period.
	Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1.0 lb ai/A)	35-day waiting period.
	Match-Up [1B,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	30-day wait for grain or harvest.

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Chinch bug (cont'd)	Mustang MAXX EC [3] (zeta-cypermethrin)	3.2 to 4.0 fl oz (0.02 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	3.84 fl oz (0.015 lb ai/A)	21-day waiting period.
	Sevin XLR [1A] (carbaryl)	1 to 2 qt (0.5 to 1 lb ai/A)	48-day waiting period for harvest, 14 days for grazing.
	Stallion [1B,3] (chlorpyrifos + zeta cypermethrin)	9.25 to 11.75 fl oz	30-day wait for harvest, 60 days for grazing or silage.
	Voliam Xpress [3,28] (lambda-cyhalothrin + chlorantraniloprole)	9.0 fl oz	21-day waiting period. Check label for timing restrictions.
Corn Earworm Striped robust caterpillars that range in color from green to pink to brown to black. <u>Damage:</u> Caterpillars injure ear tips, feed in whorls. Feeding damage may increase potential for aflatoxins in grain. <u>Threshold:</u> Not practical to control in field corn	Many Bt corn hybrids offer some suppression of corn earworm, but it is not recommended that corn earworm be controlled with insecticides.	NA	
Corn rootworm (adults) Small beetle (1/4 inches), with a black head and black legs, wing covers are greenish-yellow with black stripes, 12 spots, or no markings. <u>Damage:</u> Feed on silks. Heavy populations may interfere with pollination <u>Threshold:</u> Treat if beetles are abundant (over 5 per plant and silks are being severely clipped)	Ambush/Pounce 25WP [3] (permethrin)	6.4 to 9.6 oz (0.1 to 0.15 lb ai/A)	30-day waiting period.
	Asana XL [3] (esfenvalerate)	5.8 to 9.6 fl oz (0.03 to 0.05 lb ai/A)	21-day waiting period.
	Baythroid XL [3] (beta-cyfluthrin)	1.6 to 2.8 fl oz (0.013 to 0.022 lb ai/A)	21-day wait for grain or fodder, 0 day for green forage.
	Besiege[28,3] (chlorantraniliprole + lambda-cyhalothrin)	6.0 to 10 fl oz	21-day wait for harvest.
	Brigade 2EC [3] (bifenthrin)	2.1 to 6.4 fl oz (0.033 to 0.1 lb ai/A)	30-day waiting period for grain or grazing.
	Cobalt [1B, 3] (chlorpyrifos + gamma-cyhalothrin)	13 to 26 fl oz	21-day wait for harvest, 14 days for grazing or silage.
	Delta Gold [3] (deltamethrin)	1.5 to 1.9 fl oz (0.018 to 0.022 lb ai/A)	21-day wait for harvest, 12 days for grazing or silage.
	Dimethoate 4E [1B]	0.66 to 1 pt	14-day waiting period.
	Fastac [3] (alpha-cypermethrin)	2.7 to 3.8 fl oz (0.017 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
	Hero [3] (zeta-cypermethrin + bifenthrin)	4.0 to 10.3 fl oz	30-day wait for grain, 60 days for forage.
Karate w Zeon [3] (lambda-cyhalothrin)	1.28 to 1.92 fl oz (0.02 to 0.03 lb ai/A)	21-day waiting period.	

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Corn rootworm (adults) (cont'd)			
	Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1 lb ai/A)	35-day waiting period.
	Match-Up [1b,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	
	Mustang MAXX EC [3] (zeta-cypermethrin)	2.72 to 4.0 fl oz (0.017 to 0.025 lb ai/A)	30-day wait for grain, 60 days for forage.
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	21-day waiting period.
	Sevin XLR [1A] (carbaryl)	1 to 2 qt (0.5 to 1 lb ai/A)	48-day waiting period for harvest, 14 day for grazing.
	Stallion[1B,3] (chlorpyrifos + zeta cypermethrin)	9.25 to 11.75 fl oz	30-day waiting period for grain, 60 days for forage.
	Voliam Xpress [3, 28] (lambda-cyhalothrin + chlorantranilprole)	6.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.

Corn rootworm (larvae)

Thin, white worm-like larva that lives in soil. Damage is likely to occur in early part of growing season (before June 15).

Damage: Feed on roots, causing lodged plants and plants that "gooseneck." Root tissue and brace roots are often chewed back to the base of the stalk.

Threshold: Consider a planting-time insecticide, or a seed variety that contains transgenic "rootworm" protection if planting continuous corn.

Seed Treatments

Rootworm resistant varieties

*Transgenic seed

*Follow company's guidelines for providing refugia, crop rotations and other resistance management strategies.

Cruiser 5FS [4A]
(thiamethoxam)

**5.6 fl oz/80,000 seed

**Do not use treated seed for feed, food, or oil processing. See label for mixing and handling instructions. Follow all label restrictions.

Gaucho 600 [4A]

**6.0 fl oz/80,000 seed

Poncho 600 [4A]
(clothianidin)

**5.64 fl oz/ 80,000 seed

Force ST [3]
(tefluthrin)

3 to 4 oz/cwt seed

Do not use treated seed for feed, food, or oil processing. Do not apply Force 3G if Force ST was used.

Planting Time

Aztec 2.1 G [1B,3]
(tebupirromphos, cyfluthrin)

6.7 fl oz/1,000 ft-row

Follow manufactures' guidelines for rates, application methods grazing and crop rotation restrictions. Rotation of insecticides during successive years is suggested. Do not make a foliar application if planting time application was made.

Ballista LFC [3]
(lambda-cyhalothrin)

0.66 fl oz/1,000 ft-row

Capture LFR [3]
(bifenthrin)

0.39 to 0.98 fl oz/
1,000 ft-row

Counter 15G [1B]
(terbufos)

6 to 8 oz/1,000 ft-row

Force 3G [3]
Force CS [3]
(tefluthrin)

4 to 5 oz/1,000 ft-row
0.46 to 0.57 fl oz/
1,000 ft row

T-band or in-furrow
T-band or in-furrow

Fortress 5G [1B]
(chlorethxyfos)

3.0 to 4.5 oz/1,000 ft-row

T-band or in-furrow

Lorsban 15 G [1B]
(chlorpyrifos)

2.5 fl oz/1,000 ft-row

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Corn rootworm (larvae) (cont'd)	Proaxis 0.5 CS [3] (gamma cyhalothrin)	8 oz/1,000 ft-row	
	Thimet 20G [1B] (phorate)	0.24 oz/1,000 ft-row	
	<u>Post Seedling-Emergence Application</u>		Follow label directions for at-cultivation applications. Do not make application if planting time application was made.
	Counter 15G [1B] (terbufos)	8 oz/1,000 ft-row	
	Cobalt [1B,3] (chlorpyrifos; lambda-cyhalothrin)	38 to 42 fl oz	
	Force 3G [3] (tefluthrin)	4 to 5 oz/1,000 ft-row	
	Fortress 5G [1B] (chlorethxyfos)	3.0 to 3.75 oz/1,000 ft-row	
	Lorsban 15 G [1B] (chlorpyrifos)	8 oz/1,000 ft-row	
	Thimet 20G [1B]	4.5 to 6 oz/1,000 ft row	
	Cutworms (black, granulate, sandhill) Striped or solid colored, robust caterpillars that "roll" up when disturbed, and prefer to live under ground.	<u>Seed Treatments</u>	
	Resistant varieties	Transgenic seed	Follow company's guidelines for providing refugia, crop rotation and other resistance management strategies.
<u>Damage:</u> Cutworms generally feed at night, and live under the soil during the day. Plants will be cut at or slightly above the soil level, causing stand reductions.	<u>Pre-Plant/Planting Time</u>		
	Aztec 2.1 G [1B, 3] (tebupirromphos, cyfluthrin)	6.7 fl oz/1,000 ft-row	Follow manufactures' guidelines for rates, application methods grazing and crop rotation restrictions.
	Capture 2EC [3] (bifenthrin)	0.15 to 0.3 fl oz/1,000 ft-row	
<u>Threshold:</u> Scout fields at seedling emergence. Treat when worms are less than ½ inch long, and skips are noticed.	Counter 15G [1B] (terbufos)	6 to 8 oz/1,000 ft-row	
	Force 3G [3] Force CS [3] (tefluthrin)	4 to 5 oz./1,000 ft-row 0.46 to 0.57 fl oz/ 1,000 ft row	T band or In-furrow T band or In-furrow
	Fortress 5G [1B] (chlorethxyfos)	3.0 to 3.75 oz/1,000 ft-row	T band or In-furrow
	Lorsban 15 G [1B] (chlorpyrifos)	8 oz/1,000 ft-row	
	Proaxis 0.5 CS [3] (gamma cyhalothrin)	0.66 oz/1,000 ft-row	
	Pounce 1.5 G [3] (permethrin)	8 oz/1,000 ft-row	

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Cutworms (black, granulate, sandhill) (cont'd)			
<u>Post-emergence Sprays</u>			
	Ambush/Pounce 25WP [3] (permethrin)	6.4 to 9.6 oz (0.1 to 0.15 lb ai/A)	30-day waiting period.
	Asana XL [3] (esfenvalerate)	5.8 to 9.6 fl oz (0.03 to 0.05 lb ai/A)	21-day waiting period.
	Baythroid XL [3] (beta-cyfluthrin)	0.8 to 1.6 fl oz (0.007 to 0.013 lb ai/A)	21-day wait for grain or fodder, 0 days for green forage.
	Besiege[28,3] (chlorantraniliprole + lambda-cyhalothrin)	5.0 to 10 fl oz	21-day wait for harvest.
	Capture LFR [3] (bifenthrin)	0.2 to 0.78 fl oz/1,000 linear ft-row banded or 3.4 to 6.8 fl oz/acre as a foliar application	30-day waiting period. <u>Follow label directions.</u> Do not apply to soil with greater than 30% crop residue, do not apply more than 0.1 lb active per acre per season as an at-plant application.
	Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	(foliar) 13 to 26 fl oz (band) 1.89 fl oz/ 1,000 ft row	21-day wait for harvest, 14 days for grazing or silage.
	Delta Gold [3] (deltamethrin)	1.0 to 1.5 fl oz (0.012 to 0.018 lb ai/A)	21-day wait for harvest, 12 days for grazing or silage.
	Fastac [3] (alpha-cypermethrin)	1.3 to 2.8 fl oz (0.008 to 0.018 lb ai/A)	30-day wait for grain, 60 days for silage.
	Hero [3] (zeta-cypermethrin + (bifenthrin)	2.6 to 6.1 fl oz	30-day waiting period for grain, 60 days for grazing.
	Karate w Zeon [3] (lambda-cyhalothrin)	0.96 to 1.60 fl oz (0.015 to 0.025 lb ai/A)	21-day waiting period.
	Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1.0 lb ai/A)	35-day waiting period.
	Match-Up [1B,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	30-day wait for grain or harvest.
	Mustang MAXX EC [3] (zeta-cypermethrin)	1.28 to 2.8 fl oz (0.008 to 0.0175 lb ai/A)	30-day waiting period for grain and silage, 60 day for grazing.
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	1.92 to 3.2 fl oz (0.0075 to 0.0125 lb ai/A)	21-day waiting period.
	Stallion [1B,3] (chlorpyrifos + zeta cypermethrin)	3.75 to 11.75 fl oz	30-day waiting period for grain, 60 days for forage.
	Voliam Xpress [3,28] (lambda-cyhalothrin + chlorantraniliprole)	5.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Fall armyworm Large, striped, non-bristled worm up to 1.5 inches. Has a light colored, inverted "Y" on head. June-August	Seed Treatments Resistant varieties	Transgenic seed	Follow company's guidelines for providing refugia, crop rotation and other resistance management strategies.
Damage: Larvae cut holes in leaves at whorl stage, heaviest damage occurs on late corn when caterpillars tunnel into ear or ear shank.	Post-emergence Sprays Baythroid XL [3] (beta-cyfluthrin)	2.8 fl oz (0.022 lb ai/A)	21-day wait for grain or fodder, 0 days for green forage.
	Besiege[28,3] (chlorantraniliprole + lambda-cyhalothrin)	6.0 to 10 fl oz	21-day wait for harvest.
Threshold: Treat if 75% of plants are infested during whorl stage.	Blackhawk [5] (spinosad)	1.67 to 3.3 fl oz (0.038 to 0.075 lb ai/A)	1-day PHI for grain, 7-day wait for grazing, 28 days for fodder.
	Cobalt [1B, 3] (chlorpyrifos + gamma-cyhalothrin)	13 to 26 fl oz	21-day waiting period for harvest, 14 days for grazing or silage.
	Coragen [28] (chlorantraniliprole)	3.5 to 7.5 fl oz (0.045 to 0.098 lb ai/A)	14-day waiting period for harvest 1 day for forage, silage, stover.
	Delta Gold [3] (deltamethrin)	1.5 to 1.9 fl oz (0.018-0.022 lb ai/A)	21-day wait for harvest, 12 days for grazing or silage.
	Fastac [3] (alpha-cypermethrin)	3.2 to 3.8 fl oz (0.020 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
	Hero [3] (zeta-cypermethrin + (bifenthrin)	4.0 to 10.3 fl oz	30-day wait for grain and silage, 60 days for grazing.
	Lannate LV [1A] (methomyl)	0.75 to 1.5 pt 0.225 to 0.45 lb	3-day wait for forage, 21 days for harvest or grazing.
	Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1.0 lb ai/A)	35-day waiting period.
	Match-Up [1B,3] (chlorpyrifos + bifenthrin)		30-day wait for harvest or grazing.
	Mustang MAXX EC [3] (zeta-cypermethrin)	3.2 to 4.0 fl oz (0.02 to 0.025 lb ai/A)	30-day wait for grain and silage, 60 days for grazing.
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	21-day waiting period.
	Stallion[1B, 3] (chlorpyrifos + zeta cypermethrin)	9.25 to 11.75 fl oz	30-day wait for harvest, 60 days for grazing or silage.
	Voliam Xpress[3, 28] (lambda-cyhalothrin + chlorantraniliprole)	6.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Flea beetles			
Shiny, black beetle about 1/16 inch that jumps when disturbed.	Ambush/Pounce 25WP [3] (permethrin)	6.4 to 9.6 oz (0.1 to 0.15 lb ai/A)	30-day waiting period.
<u>Damage:</u> Early spring-summer. Plant tissue is scraped from leaf, giving it a drought stress appearance. Can cause delayed development is cool growing conditions	Asana XL [3] (esfenvalerate)	5.8 to 9.6 fl oz (0.03 to 0.05 lb ai/A)	21-day waiting period.
	Baythroid XL [3] (beta-cyfluthrin)	0.8 to 1.6 fl oz (0.007 to 0.013 lb ai/A)	21-day wait for grain or fodder, 0 days for green forage.
	Besiege[28,3] (chlorantraniliprole + lambda cyhalothrin)	6.0 to 10 fl oz	21-day wait for harvest.
<u>Threshold:</u> Apply to small plants when beetles first appear and some plants are being killed.	Cobalt [1B, 3] (chlorpyrifos + gamma-cyhalothrin)	13 to 26 fl oz	21-day waiting period for harvest, 14 days for grazing or silage.
	Delta Gold [3] (deltamethrin)	1.0 to 1.5 fl oz (0.012 to 0.018 lb ai/A)	35-day waiting period.
	Fastac [3] (alpha-cypermethrin)	2.7 to 3.8 fl oz (0.017 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
	Hero [3] (zeta-cypermethrin + (bifenthrin)	2.6 to 6.1 fl oz	30-day wait for grain and silage, 60 days for grazing.
	Karate w Zeon [3] (lambda-cyhalothrin)	1.28 to 1.92 fl oz (0.02 to 0.03 lb ai/A)	21-day wait for silage, 3 days for grazing.
	Lannate LV [1A] (methomyl)	0.75 to 1.5 pt 0.225 to 0.45 lb	3-day wait for forage, 21 days for harvest or grazing.
	Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1.0 lb ai/A)	35-day waiting period.
	Match-Up [1B,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	30-day wait for grain or harvest.
	Mustang MAXX EC [3] (zeta-cypermethrin)	2.72 to 4.0 fl oz (0.017 to 0.025 lb ai/A)	30-day wait for grain and silage, 60 days for grazing.
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	21-day waiting period.
	Sevin XLR [1A] (carbaryl)	1 to 2 qt (0.5 to 1 lb ai/A)	48-day wait for harvest: 14 days for grazing.
	Stallion[1B,3] (chlorpyrifos + zeta cypermethrin)	9.25 to 11.75 fl oz	30-day waiting period for grain, 60 days for forage.
	Voliam Xpress [3,28] (lambda-cyhalothrin + chlorantraniliprole)	6.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Grasshopper			
1-2 inches, outer wings leathery, inner wings clear or colored.	Asana XL [3] (esfenvalerate)	2.9 to 5.8 fl oz (0.015 to 0.03 lb ai/A)	21-day waiting period.
Enlarged hind legs designed for jumping.	Baythroid XL [3] (beta-cyfluthrin)	2.1 to 2.8 fl oz (0.017 to 0.022 lb ai/A)	21-day wait for grain or fodder, 0 day for green forage.
<u>Damage:</u> Chew leaves, leaving ragged edges, or completely chewing leaf blade. Damage emerging seed heads, causing yield loss.	Cobalt [1B, 3] (chlorpyrifos + gamma-cyhalothrin)	7 to 13 fl oz	21-day waiting period for harvest, 14 days for grazing or silage.
	Coragen [28] (chlorantraniliprole)	2.0 to 5.0 fl oz (0.026 to 0.065 lb ai/A)	14-day waiting period for harvest 1 day for forage, silage, stover.
<u>Threshold:</u> Consider treating if numbers reach 8 to 14 in the field, or 20 to 40 in field margins.	Delta Gold [3] (deltamethrin)	1 to 1.5 fl oz (0.012-0.018 lb ai/A)	21-day wait for harvest; 12 days for grazing or forage.
	Fastac [3] (alpha-cypermethrin)	2.7 to 3.8 fl oz (0.017 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
See F-7196, Grasshopper Management in Rangeland, Pastures, and Crops for more information.	Hero [3] (zeta-cypermethrin + bifenthrin)	2.6 to 6.1 fl oz	30-day waiting period for grain, 60 days for grazing.
	Karate w Zeon [3] (lambda-cyhalothrin)	1.28 to 1.92 fl oz (0.02 to 0.03 lb ai/A)	21-day waiting period.
	Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1 lb ai/A)	35-day waiting period.
	Match-Up [1B,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	30-day wait for harvest or grazing.
	Mustang MAXX EC [3] (zeta-cypermethrin)	2.72 to 4.0 fl oz (0.017 to 0.025 lb ai/A)	30-day waiting period for grain and silage, 60 day for grazing.
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	1.92 to 3.2 fl oz (0.0075 to 0.0125 lb ai/A)	21-day waiting period.
	Sevin XLR [1A] (carbaryl)	0.5 to 1.5 qt (0.25 to 0.75 lb ai/A)	48-day wait for harvest: 14 days for grazing.
	Voliam Xpress[3,28] (lambda-cyhalothrin + chlorantraniliprole)	6.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Mites			
Small, less than 1/100 inch. Cause brown stippling of leaves. Banks grass and two spotted spidermites are most common pests.	Capture 2EC [3] (bifenthrin)	5.12 to 6.4 fl oz (0.08 to 0.1 lb ai/A)	30-day waiting period.
	Comite II [20] (propargite)	36 to 54 fl oz/A	30-day waiting period. Apply when mite colonies first form, when leaves are dry.
<u>Damage:</u> Causes stippling of leaves, severe infestations can kill leaves. Infestations generally start at lower leaves and move upward.	Dimethoate 4E [1B]	0.66 to 1 pt	14-day waiting period.
	Hero [3] (zeta cypermethrin + bifenthrin)	10.3 fl oz	35-day waiting period.
<u>Threshold:</u> Treat when there is visible damage on the lower third of the plant and small colonies are visible on the middle third of the plant, and the corn has not yet reached the hard dough stage.	Oberon 2 SC [23] (spiromesifen)	2.85 to 8.0 fl oz	30-day wait for harvest, 5 days for forage or silage.
	Onager [10A] (hexythiazox)	10 to 24 fl oz	45-day waiting period.
	Portal [21A] (fenpyroximate)	1.5 to 2 pints (0.267 to 0.71 lb ai/A)	14-day waiting period.
	Zeal WDG [10B] (etoxazole)	1.0 to 3.0 oz (0.045 to 0.135 lb ai/A)	* for seed production only, 21 day waiting period.
			NOTE: Treatments at hard-dough stage or later are not cost effective. When heavy infestations occur, erratic control will usually be the rule. Thorough coverage is important, higher volumes (2 to 3 gallons or more per acre) when applied by aircraft increase the effectiveness of the spray.
Seedcorn maggot, Seed corn beetle			
Maggots are yellowish-white, tapered larvae about 1/4 inch. Beetles are about 3/8 inch, with two black stripes on brown wing covers.	Seed Treatments		Follow manufactures' guidelines for rates, application methods grazing and crop rotation restrictions. Rotation of insecticides during successive years is suggested.
	Cruiser 5FS [4A] (thiamethoxam)	0.56 to 3.61 fl oz / 80,000 seeds	
<u>Damage:</u> Damage occurs in spring, especially if soils are cool and moist and seeds are not germinating rapidly. Damage is notices as skips in plant stands. Seed will be hollowed out.	Poncho 600 [4A] (clothianidin)	1.13 to 2.26 fl oz/ 80,000 seeds	
	Force ST [3] (tefluthrin)	3 to 4 oz/cwt seed	
<u>Threshold:</u> Replanting is the only recourse if damage has already occurred. Use a planting-time treatment if fields have a history. No-till fields may be more vulnerable to attack.	Planting Time		
	Aztec 2.1 G [1B,3] (tebupirromphos, cyfluthrin)	6.7 fl oz/1,000 ft-row	
	Ballista LFC [3] (lambda-cyhalothrin)	0.66 fl oz/1,000 ft-row	
	Capture LFR [3] (bifenthrin)	0.2 to 0.78 fl oz/ 1,000 ft-row	Seed corn beetle only.
	Counter 15G [1B] (terbufos)	6 to 8 oz/1,000 ft-row	
	Lorsban 15G [1B] (chlorpyrifos)	8 to 12 oz/1,000 ft-row	T-band or In-furrow.
	Force 3G [3] (tefluthrin)	4 to 5 oz/1,000 ft-row	T-band or In-furrow.
	Fortress 5G [1B] (chlorethxyfos)	3.0 to 3.75 oz/1,000 ft-row	

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>	
<p>Southwestern corn borer Full grown caterpillars are white with prominent dark spots on body. Eggs are laid in masses of 12 to 30. They overlap like egg scales. Eggs are white when first laid, then red bands appear before they hatch.</p> <p><u>Damage:</u> First generation causes "dead heart" in plants. Second generation tunnels throughout stalk. May girdle mature stalks causing lodging.</p> <p><u>Threshold:</u> Threshold based on egg masses. Treat if 25% of plants have egg masses or newly hatched larvae. A repeat application may be needed in 7 to 10 days.</p>	<u>Seed Treatments</u>			
	Resistant varieties	Transgenic seed	Follow company's guidelines for providing refugia, crop rotation and other resistance management strategies.	
	<u>Post-emergence Sprays</u>			
		Baythroid XL [3] (beta-cyfluthrin)	1.6 to 2.8 fl oz (0.013 to 0.022 lb ai/A)	21-day wait for grain or fodder, 0 days for green forage.
		Besiege[28,3] (chlorantraniliprole + lambda-cyhalothrin)	6.0 to 10 fl oz	21-day wait for harvest.
		Blackhawk [5] (spinosad)	2.2 to 3.3 fl oz (0.05 to 0.075 lb ai/A)	1-day PHI for grain, 7-day wait for grazing, 28 days for fodder.
		Capture 2EC [3] (bifenthrin)	2.6 to 6.4 fl oz (0.033 to 0.1 lb ai/A)	30-day waiting period.
		Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	19 to 38 fl oz	21-day waiting period for harvest, 14 days for grazing or silage.
		Delta Gold [3] (deltamethrin)	1.5 to 1.9 fl oz (0.018 to 0.022 lb ai/A)	21-day wait for harvest; 12 days for forage or grazing.
		Fastac [3] (alpha-cypermethrin)	2.7 to 3.8 fl oz (0.017 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
		Intrepid 2F [18] (methoxyfenozide)	4 to 16 fl oz (0.06 to 0.25 lb ai/A)	21-day waiting period.
		Karate w Zeon (lambda cyhalothrin)	1.28 to 1.92 fl oz (0.02 to 0.03 lb ai/A)	35-day waiting period.
		Hero [3] (zeta-cypermethrin + bifenthrin)	4.0 to 10.3 fl oz	30-day waiting period for grain and silage, 60 day for grazing.
		Lorsban 4E [1B] (chlorpyrifos)	1.5 to 2 pt (0.75 to 1 lb ai/A)	30-day waiting period for grain and silage.
		Match-Up [1b,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	30-day wait for grain or harvest.
		Mustang MAXX EC [3] (zeta-cypermethrin)	2.72 to 4.0 fl oz (0.017 to 0.025 lb ai/A)	30-day waiting period for grain and silage, 60 day for grazing.
		Prevathon[28] (chlorantraniliprole)	14 to 20 fl oz (0.047 to 0.067 lb ai/A)	14-day waiting period for harvest 1 day for forage, silage, stover.
		Proaxis 0.5 SC [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	21-day waiting period.
		Radiant SC [5] (spinetoram)	3.0 to 6.0 fl oz (0.023 to 0.047 lb ai/A)	28-day wait for harvest, 3 days for forage or fodder.
		Stallion [1B,3] (chlorpyrifos + zeta cypermethrin)	9.25 to 11.75 fl oz	30-day waiting period for grain, 60 days for forage.
	Voliam Xpress [3, 28] (lambda-cyhalothrin + chlorantraniloprole)	6.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.	

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Western bean cutworm Larvae are dark brown with faint diamond-shaped markings on their backs. Measure 1.5 inches. Eggs are deposited in masses of 4 to 200 on upper surface of leaves.	<u>Seed Treatments</u>		
	Resistant varieties	Transgenic seed	Follow company's guidelines for providing refugia, crop rotation and other resistance management strategies.
<u>Damage:</u> Larvae feed on developing tassel, or silk. They feed on developing kernels once the ear has formed.	<u>Post-emergence Sprays</u>		
	Pounce 25 WP (permethrin)	3.2 to 6.4 oz (0.5 to 0.1 lb ai/A)	30-day waiting period.
<u>Threshold:</u> Treat of 8 percent or more of the plants have egg masses or small larvae in the tassels and the crop is 95% tasseled.	Asana XL [3] (esfenvalerate)	2.9 to 5.8 fl oz (0.015 to 0.03 lb ai/A)	21-day waiting period.
	Baythroid XL [3] (beta-cyfluthrin)	1.6 to 2.8 fl oz (0.013 to 0.022 lb ai/A)	21-day waiting period.
	Besiege[28,3] (chlorantraniliprole + lambda-cyhalothrin)	5.0 to 10 fl oz	21-day wait for harvest.
	Blackhawk [5] (spinosad)	2.2 to 3.3 fl oz (0.05 to 0.075 lb ai/A)	1-day PHI for grain, 7-day wait for grazing, 28 days for fodder.
	Capture 2EC [3] (bifenthrin)	2.6 to 6.4 fl oz (0.033 to 0.1 lb ai/A)	30-day waiting period.
	Cobalt [1B, 3] (chlorpyrifos + gamma-cyhalothrin)	13 to 26 fl oz	21-day wait for harvest, 14 days for grazing or silage.
	Coragen [28] (chlorantraniloprole)	3.5 to 7.5 fl oz (0.045 to 0.098 lb ai/A)	14-day waiting period for harvest 1 day for forage, silage, stover.
	Fastac [3] (alpha-cypermethrin)	1.8 to 3.8 fl oz (0.011 to 0.025 lb ai/A)	30-day wait for grain, 60 days for silage.
	Intrepid 2F [18] (methoxyfenozide)	4 to 16 fl oz (0.06 to 0.25 lb ai/A)	21-day wait for harvest.
	Karate w Zeon [3] (lambda-cyhalothrin)	0.96 to 1.60 fl oz (0.015 to 0.025 lb ai/A)	21-day wait for harvest or grazing.
	Lorsban 4E [1B] (chlorpyrifos)	1 to 2 pt (0.5 to 1 lb ai/A)	35-day wait for harvest, do not graze or use for forage.
	Match-Up [1B,3] (chlorpyrifos + bifenthrin)	5.5 to 16.4 fl oz	30-day wait for harvest or grazing.
	Mustang MAXX EC [3] (zeta-cypermethrin)	1.76 to 4.0 fl oz (0.011 to 0.025 lb ai/A)	30-day waiting period for grain and silage, 60 day for grazing.
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	1.92 to 3.2 fl oz (0.0075 to 0.0125 lb ai/A)	21-day waiting period.
	Radiant SC [5] (spinetoram)	3.0 to 6.0 fl oz (0.023 to 0.047 lb ai/A)	28-day wait for harvest, 3 days for forage or fodder.
	Sevin XLR [1A] (carbaryl)	2 qt (1 lb ai/A)	48-day wait for harvest: 14 days for grazing.
	Stallion [1B,3] (chlorpyrifos + zeta cypermethrin)	5.0 to 11.75 fl oz	30-day waiting period for grain, 60 days for forage.
	Voliam Xpress [3,28] (lambda-cyhalothrin + chlorantraniloprole)	5.0 to 9.0 fl oz	21-day waiting period. Check label for timing restrictions.

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
<p>White grub Large, "C" shaped grub with a white body and a brown head.</p> <p><u>Damage:</u> Feed on developing roots, cause slow growth, stunting and stand loss.</p> <p><u>Threshold:</u> No reliable thresholds are available. Consider using an at-planting treatment for "suppression" if field has a history of grub problems.</p>	<u>Seed Treatments</u>		
	Cruiser 5FS [4A] (thiamethoxam)	0.56 to 3.61 fl oz / 80,000 seed	Do not use treated seed for feed, food, or oil processing.
	Poncho 600 [4A] (clothianidin)	1.13 fl oz/80,000 seed	Do not use treated seed for feed, food, or oil processing.
	Force ST [3]	3 to 4 oz/cwt seed	Do not use Force 3G if Force ST was used.
	<u>Planting Time</u>		
	Aztec 2.1 G [1B,3] (tebupirromphos, cyfluthrin)	6.7 fl oz/1,000 ft-row	Do not use treated seed for feed, food, or oil processing.
	Ballista LFC [3] (lambda-cyhalothrin)	0.66 fl oz/1,000 ft-row	Follow manufactures' guidelines for rates, application methods grazing and crop rotation restrictions. Rotation of insecticides during successive years is suggested.
	Counter 15G [1B] (terbufos)	6 to 8 oz/1,000 ft-row	T-band or in-furrow.
	Force 3G [3] (tebupirromphos, cyfluthrin)	4 to 5 oz/1,000 ft-row	T-band or in-furrow.
	Fortress 5G [1B] (chlorethxyfos)	3.0 to 3.75 oz/1,000 ft-row	
Proaxis 0.5 SC [3] (gamma-cyhalothrin)	0.66 fl oz/1,000 ft-row		
<p>Wireworm Hard-shelled, smooth, cylindrical, yellowish to brown worms. 2- to 6-year life cycle. More common in corn planted into a sod or grass pasture.</p> <p><u>Damage:</u> Feed on seed, seedling. Cause stunting and stand loss.</p> <p><u>Threshold:</u> No reliable thresholds are available. Treat if field has a history of problems. Wireworms may be more of a problem in no-till or minimum till fields.</p>	<u>Seed Treatments</u>		
	Cruiser 5FS [4A] (thiamethoxam)	0.56 to 3.61 fl oz / 80,000 seeds	Do not use treated seed for feed, food, or oil processing.
	Poncho 600 [4A] (clothianidin)	1.13-2.36 fl oz/ 80,000 seeds	Do not use treated seed for feed, food, or oil processing.
	Force ST [3] (tebupirromphos, cyfluthrin)	3 to 4 oz/cwt seed	Do not use Force 3G if Force ST was used.
	<u>Planting Time</u>		
	Aztec 2.1 G [1B,3] (tebupirromphos, cyfluthrin)	6.7 fl oz/1,000 ft-row	Do not use treated seed for feed, food, or oil processing.
	Ballista LFC [3] (lambda-cyhalothrin)	0.66 fl oz/1,000 ft-row	Follow manufactures' guidelines for rates, application methods grazing and crop rotation restrictions. Rotation of insecticides during successive years is suggested.
	Capture 1.5 G [3]	3.2 to 8 oz/1,000 ft-row	
	Counter 15G [1B] (terbufos)	6 to 8 oz/1,000 ft-row	T-band or in-furrow.
	Force 3G [3] (tebupirromphos, cyfluthrin)	4 to 5 oz/1,000 ft-row	T-band or in-furrow.
Fortress 5G [1B] (chlorethxyfos)	3.0 to 3.75 oz/ 1,000 ft-row		

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide Formulation and [Group]* and (active ingredient)</i>	<i>Rate of Product per Acre or 1,000 ft-row</i>	<i>Comments</i>
Wireworm (cont'd)	Lorsban 15 G[1B] (chlorpyrifos)	8 oz/1,000 ft-row	
	Proaxis 0.5 SC [3] (gamma-cyhalothrin)	0.66 fl oz/1,000 ft-row	

Pre-harvest Intervals and grazing restrictions

Ambush/Pounce	30-day PHI for grazing or harvest
Asana XL	21-day PHI for harvest or grazing
Aztec 2.1G	Do not exceed 7.3 lb. per acre per crop season
Ballista LFC	21-day waiting period for grain or fodder.
Baythroid XL	21-day waiting period for grain or fodder, 0 days for green forage
Besiege	21-day waiting period for grain or fodder, 1 day for grazing
Blackhawk	1-day PHI for grain, 7-day wait for forage, or 28-day wait for fodder
Capture 2EC	30-day PHI for harvest or grazing
Cobalt	21-day waiting period for harvest, 14 days for grazing
Comite II	Apply in a minimum of 20 gal of water/acre ground, 3 gal by air
Counter 15G	Check label for precautions regarding application of Counter 15G and its interaction with ALS inhibiting herbicides.
Cruiser 5FS	No grazing restriction
Delta Gold	21-day PHI for harvest, 12 days for forage or grazing
Dimethoate	Apply by aircraft. 14 day PHI for harvest or grazing
Fastac	30-day PHI for harvest, 60 days for grazing
Force 3G	30-day crop rotation restriction
Fortress 5G	30-day crop rotation restriction
Hero	30-day PHI for harvest, 60 days for grazing
Intrepid	21-day PHI for harvest
Karate w Zeon	21-day PHI for harvest
Lorsban 4E	35-day PHI for harvest, do not graze or use for silage
Malathion	5-day PHI for harvest or grazing
Match-Up	30 day PHI for harvest or grazing
Methomyl	3-days for forage, 21-day PHI for harvest or grazing
Mustang MAXX	30-day PHI for harvest, 60 days for grazing
Oberon	5-day PHI for green forage, 30 days for grain or stover
Onager	45-day PHI for harvest or grazing
Poncho	45-day PHI for harvest or grazing
Portal	14-day PHI
Prevathon	14-day PHI for harvest, 1 day for forage, silage, fodder
Proaxis	21-day PHI for harvest or grazing
Sevin XLR	14-day PHI for grazing, 48 days for harvest
Stallion	30-day PHI for grain, 60 days for forage
Voliam Xpress	21-day PHI
Zeal	21-day PHI

*MOA group numbers in brackets [#] following 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). 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

WE ARE OKLAHOMA

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:

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 - 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.

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