



Current Report

EXTENSION

Oklahoma Cooperative Extension Fact Sheets are also available on our website at: extension.okstate.edu

Management of Insect and Mite Pests in Small Grains

Tom A. Royer
Extension Entomologist

Kristopher L. Giles
Regents Professor

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide, Formulation, [MOA Group] and (Active Ingredient)</i>	<i>Rate of Product and (lb active ingredient) per Acre</i>	<i>Comments</i>
<p>Winter grain mite Tiny dark brown mites with red legs and a red spot on its abdomen. Prefer cool, moist climate, and are more active on cloudy days or evenings.</p> <p>Damage: Leaves appear stunted and silver colored.</p> <p>Threshold: No established threshold; treat if injury symptoms and mites are present. Day time temperatures that exceed 75 F will reduce populations.</p>	Malathion 5 EC [1B] (malathion)	1.6 pt (1.25 lb ai/A)	7-day waiting period for grazing or harvest.

*Other products, such as dimethoate (Dimate and others) and chlorpyrifos (Lorsban, Whirlwind and others) can be applied under 2ee regulations, however since this pest is not specifically labeled, the user assumes all responsibility for the application and results.

Pre-harvest Intervals and grazing restrictions

Baythroid XL	3-day PHI for grazing, 30-days for harvest. Two applications/season
Blackhawk	3-day PHI for grazing, 21-day PHI for harvest
Cobalt	14-day PHI for grazing, 28-days for harvest. Two applications/season
Cruiser 5FS	No grazing restriction
Dimethoate	14-day PHI for grazing, 35-days for harvest. Two applications/season
Fastac	14-day PHI
Gaucho 480, XT	45-day PHI for harvest or grazing
Lannate	14-day PHI for harvest or grazing
Lorsban 4E	14-day PHI for grazing, 28-days for harvest. Two applications/season.
Mustang MAXX	14-day PHI for grazing or harvest
Nipsit	Do not feed treated grain.
Prevathon	14-day PHI
Proaxis 0.5EC	30-day PHI for harvest or hay, 7-days for grazing
Prolex 1.25 CS	30-day PHI for harvest or grazing
Radiant	4-day PHI for grazing, 21-days for harvest
Sivanto	7-day PHI for grazing, 21-day PHI for harvest
Stallion	14-day PHI for grazing, 28-day PHI for harvest
Transform	7-day PHI for grazing, 14-day PHI for grain or straw harvest
Warrior II	7-day PHI for grazing, 30-days for harvest

* Group numbers in brackets [#] preceding 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 pesticide information presented in this publication was current with federal and state regulations at the time of printing. The user is responsible for determining that the intended use is consistent with the label of the product being used. Use pesticides safely. Read and follow label directions. The information given 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.

Oklahoma State University, as an equal opportunity employer, complies with all applicable federal and state laws regarding non-discrimination and affirmative action. Oklahoma State University is committed to a policy of equal opportunity for all individuals and does not discriminate based on race, religion, sex, color, national origin, marital status, sexual orientation, gender identity/ expression, disability, or veteran status with regard to employment, educational programs and activities, and/or admissions. For more information, visit <https://eeo.okstate.edu>

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 for Agricultural Programs and has been prepared and distributed at a cost of 20 cents per copy. Revised 12/2020 GH.

There are several arthropod pests that damage small grains sporadically throughout the region. Pesticides should not be a substitute for good agronomic practices or used as “preventative insurance”. Pesticide misuse can cause pest resurgence issues and is rarely economically or environmentally justifiable. Many small grain 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 OSU publications for additional information.

CR-7088	Effect of Planting Date and Seed Treatment on Diseases and Insect Pests of Wheat
CR-7668	Foliar Fungicides and Wheat Production in Oklahoma
EPP-7086	Hessian Fly Management in Oklahoma Winter Wheat
EPP-7093	Mites in Small Grains
EPP-7094	Common Small Grain Caterpillars in Oklahoma
EPP-7196	Grasshopper Management in Rangeland, Pasture and Crops
EPP-7328	Wheat Streak Mosaic, High Plains Disease and Triticum Mosaic: Three virus diseases of wheat in Oklahoma.
PSS 2132	No-till Wheat Production in Oklahoma
PSS-2139	Farmer-saved Wheat Seed in Oklahoma: Questions and Answers
PSS-2142	2013 Wheat Variety Comparison
PSS-2777	Clearfield Wheat Production Systems in Oklahoma

Management of Insect and Mite Pests in Small Grains

<i>Pest, Damage and Treatment Threshold</i>	<i>Insecticide, Formulation, [MOA Group] and (Active Ingredient)</i>	<i>Rate of Product and (lb active ingredient) per Acre</i>	<i>Comments</i>
Aphids	Planting Time		
Corn leaf aphid: blue green with black legs, cornicles and antennae; antennae less than ½ length of body	Cruiser 5FS [4A] (thiamethoxam)	0.75 to 1.33 fl oz/cwt seed	Do not use treated seed as feed. Many seed treatment active ingredients are combined with fungicides and sold under various trade names. Some have grazing waiting periods, so read label carefully.
English grain aphid: lime green, “spindly legs” with black antennae, cornicles and legs. Antennae more than ½ length of body.	Gaucho 480 [4A] Gaucho XT [4A] (imidacloprid)	1 to 3 fl oz/cwt seed 3.4 fl oz/cwt seed	
	Nipsit [4A] (clothianidin)	0.75 to 1.79 fl oz/cwt seed	
Bird cherry oat aphid: olive green with brownish-red spot on back around base of cornicles.			

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)		Post-Plant	
Rice root aphid is similar in appearance to bird cherry oat aphid, but tends to feed on crown, beneath the soil.	Besiege [3,28] (lambda-cyhalothrin + chlorantraniliprole)	6.0 to 10.0 fl oz	30-day PHI
Greenbug: See greenbug section	Cobalt [1B,3] or (chlorpyrifos + gamma-cyhalothrin)	7 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw (other names Bolton, use labeled rates).
Russian wheat aphid: see Russian wheat aphid section.	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	6 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw.
Damage: Corn leaf aphid and English grain aphid do not usually require control.	Dimethoate 4EC [1B] (dimethoate)	0.5 to 0.75 pt (0.25 to 0.375 lb ai/A)	Wheat only. 14-day waiting period for grazing, 35-day waiting period for harvest. Two applications per season.
Bird cherry oat aphid can reduce yield, and is an important vector of Barley Yellow Dwarf virus.	Lorsban 4E [1B] (chlorpyrifos)	0.5 to 1 pt (0.25 to 0.5 lb ai/A)	14-day waiting period for grazing, 28-day waiting period for harvest. Two applications per season. (other names, Hatchet, Warhawk).
Threshold: Treat for bird cherry oat aphids if numbers exceed 30 per stem. Consider using low rate of seed treatment if planting for forage + grain. There is no threshold for English grain aphid, corn leaf aphid, or rice root aphid.	Malathion 5 EC [1B] (malathion)	1.5 pt (0.93 lb ai/A)	7-day waiting period for grazing or harvesting. (other names, Fyfanon).
	Mustang MAXX [3] (zeta-cypermethrin)	3.2 to 4.0 pt (0.02 to 0.025 lb ai/A)	Control may be variable. 14-day waiting period for grazing or harvesting. (other names, Respect, Respect EC).
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	Wheat, wheat hay, triticale. 30-day waiting period for harvest and fodder, 7-days for grazing harvest (check label for aphid species).
	Sivanto Prime [4D] (flupyradifurone)	7.0 to 14.0 fl oz (0.09 to 0.137 lb ai/A)	7-day waiting period for forage, 21-days for harvest.
	Transform WG [4C] (sulfoxaflor)	0.75 to 1.5 oz (0.023 to 0.047 lb ai/A)	7-day waiting period for grazing, 14 days for grain harvest.
	Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	Wheat, wheat hay, and triticale. 7-day waiting period for grazing, 30 days for harvest. (other names; Grizzly, Kaiso, Silencer, Taiga).
Army cutworm Gray striped caterpillar that curls up in to a tight "C" when disturbed. Evident from January through March.	Baythroid XL [3] (beta-cyfluthrin)	1 to 1.8 fl oz. (0.016 to 0.028 lb ai/A)	7-day waiting period for grazing, 30 days for harvest.
Damage: Cuts plants at soil line, can kill plants if it enters the crown.	Besiege [3,28] (lambda-cyhalothrin + chlorantraniliprole)	5.0 to 8.0 fl oz	30-day PHI.
Threshold: Two to three caterpillars per foot of row if conditions are dry, if moisture is adequate, four to five per foot of row.	Cobalt [1B,3] or (chlorpyrifos + gamma-cyhalothrin)	13 to 25 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw (other names Bolton, use labeled rates).
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	11 to 25 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw.
	Fastac CS [3] (alpha-cypermethrin)	1.3 to 3.8 fl oz (0.008 to 0.025 lb ai/A)	14-day PHI.
	Mustang MAXX [3] (zeta-cypermethrin)	1.28 to 4.0 fl oz (0.008 to 0.025 lb ai/A)	14-day waiting period for grazing or harvesting.
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	1.92 to 3.20 fl oz (0.0075 to 0.0125 lb ai/A)	Wheat, wheat hay, triticale. 30-day waiting period for harvest and fodder, 7-days for grazing harvest (other names: Declare, Prolex).
	Stallion [1B, 3] (chlorpyrifos + zeta-cypermethrin)	3.75 to 11.75 fl oz	14-day Phi for forage, 28 days for grain or straw.
	Tombstone [3] (cyfluthrin)	1.0 to 1.8 fl oz (0.016 to 0.028 lb ai/A)	3-day waiting period for grazing, 30- day for harvest.
	Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	Wheat, wheat hay, and triticale. 7-day waiting period for grazing, 30 days for harvest. (other names; Grizzly, Kaiso, Silencer, Taiga).

CR-7194.2

Pest, Damage and Treatment Threshold	Insecticide, Formulation, [MOA Group] and (Active Ingredient)	Rate of Product and (lb active ingredient) per Acre	Comments
Russian wheat aphid Lime-green colored, "powdery" body, with an elongated, spindle-shaped body. Has a "double tail" appearance when viewed from the side. Lacks prominent cornicles.	Planting Time Cruiser 5FS [4A] (thiamethoxam)	0.75 to 1.33 fl oz/cwt seed	Wheat and barley. No grazing restriction. Do not use treated seed as feed.
Damage: Infested leaves may have longitudinal white or purple streaks. Leaves may roll up and look like "onion leaves." If heavily infested, plants may become prostrate or flattened.	Gaucho 480 [4A] Gaucho XT [4A] (imidacloprid)	1 to 3 fl oz/cwt seed	Wheat and barley. 45-day waiting period for grazing. Do not use treated seed as feed. (other names; Attendant, Sativa IM Max, Senator)
Thresholds: Treatment thresholds are variable, depending upon growth stage and crop condition.	Post-Plant Baythroid XL [3] (beta cyfluthrin)	1.8 to 2.4 fl oz (0.014 to 0.019 lb ai/A)	7-day waiting period for grazing; 30 days for harvest.
	Cobalt [1B,3] or (chlorpyrifos + gamma-cyhalothrin)	7 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw (other names Bolton, use labeled rates).
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	6 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw.
	Dimethoate 4E [1B] (dimethoate)	0.5 to 0.75 pt (0.25 to 0.375 lb ai/A)	Wheat only. 14-day waiting period for grazing, 35-day waiting period for harvest. Two applications per season.
	Lorsban 4E [1B] (chlorpyrifos)	0.5 to 1 pt (0.25 to 0.5 lb ai/A)	14-day waiting period for grazing, 28-day waiting period for harvest. Two applications per season. (other names, Hatchet, Warhawk)
	Mustang MAXX [3] (zeta-cypermethrin)	3.2 to 4.0 fl oz (0.02 to 0.025 lb ai/A)	14-day waiting period for grazing or harvesting. (other names, Respect, Respect EC)
	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	Wheat, wheat hay, triticale. 30-day waiting period for harvest and fodder, 7-days for grazing harvest (other names: Declare, Prolex)
	Stallion [1B, 3] (chlorpyrifos + zeta-cypermethrin)	9.25 to 11.75 fl oz	14-day waiting period for grazing, 28-days for harvest.
	Sivanto Prime [4D] (flupyradifurone)	7.0 to 14.0 fl oz (0.09 to 0.137 lb ai/A)	14-day waiting period for grazing, 21-days for harvest.
	Tombstone [3] (cyfluthrin)	1.8 to 2.4 fl oz (0.028 to 0.038 lb ai/A)	3-day waiting period for grazing; 30 days for harvest.
	Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	Wheat, wheat hay, and triticale. 7-day waiting period for grazing, 30 days for harvest. (other names; Grizzly, Kaiso, Silencer, Taiga)
Wheat curl mite Tiny sausage-shaped mites that feed on leaves and heads.	No effective chemical control is registered.		Delayed planting and management of volunteer wheat may reduce problems.
Damage: They do not cause direct damage, but are a vector for Wheat Streak Mosaic Virus and the virus that causes High Plains disease.			
Threshold: None			
White grub "C" shaped whitish grub with a tan head and swollen tip of abdomen, measuring up to 1½ inches.	No effective chemical control is registered.		While there is no effective insecticide registered for white grub control, systemic seed treatments such as Gaucho or Cruiser may provide some suppression because they are labeled for control of white grubs in other crops; however, there is no Oklahoma data to support that possibility.
Damage: Feed on roots. Cause stand loss, poor emergence and thin stands.			
Threshold: None			

CR-7194.7

Pest, Damage and Treatment Threshold	Insecticide, Formulation, [MOA Group] and (Active Ingredient)	Rate of Product and (lb active ingredient) per Acre	Comments
Greenbug (cont'd)	Proaxis 0.5 CS [3] (gamma-cyhalothrin)	3.84 fl oz (0.015 lb ai/A)	Wheat, wheat hay, triticale. 30-day waiting period for harvest and fodder, 7-days for grazing harvest (other names: Declare, Prolex)
	Sivanto Prime [4D] (flupyradifurone)	7.0 to 14.0 fl oz (0.09 to 0.137 lb ai/A)	7-day waiting period for grazing, 21-days for harvest.
	Transform WG [4C] (sulfoxaflor)	0.75 to 1.5 oz (0.023 to 0.047 lb ai/A)	7-day waiting period for grazing, 14 days for grain harvest.
	Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	Wheat, wheat hay, and triticale. 7-day waiting period for grazing, 30 days for harvest. (other names; Grizzly, Kaiso, Silencer, Taiga)
Hessian fly Small, fragile mosquito-like fly (adult) larva is whitish, shiny, about 3/16 inches. Flaxseed (puparium) is 3/16 inches, dark brown, inserted at joint of stem. Damage: Stunts plants in fall, causes lodging of heads in spring. Threshold: No established threshold. Delayed planting will reduce the incidence of Hessian fly infestations, but there is no established "fly free" planting date for most of Oklahoma. Some wheat varieties are resistant to the common Hessian fly biotypes (A, B, C and D) found in Oklahoma. See EPP-7086 Hessian Fly Management in Oklahoma Winter Wheat	Cruiser 5FS [4A] (thiamethoxam)	0.75 to 1.33 fl oz/cwt seed	Do not use surplus treated seed for feed or food. Follow label instructions for application and storage conditions.
	Gaucho 480 [4A] Gaucho XT [4A] (imidacloprid)	1 to 3 fl oz/cwt seed 3.4 fl oz/cwt seed	Wheat and barley. 45-day waiting period for grazing. Do not use treated seed as feed.
	Nipsit [4A] (clothianidin)	1.79 fl oz/cwt seed	Do not use treated seed as feed.
			Seed treatments will not provide control of spring brood Hessian fly. Seed treatment combined with later planting will improve effects of insecticide. Consider using a resistant variety for added protection, see PSS-2142, Wheat Variety Comparison for variety ratings of resistance to Hessian fly.
Pale western cutworm Caterpillar is gray with no prominent stripes. Damage: Cuts plants below soil surface. Generally found in the Oklahoma Panhandle, about two to three weeks later than army cutworm. Threshold: Treat if two or more larvae are found per linear foot of row.	Baythroid XL [3] (beta-cyfluthrin)	1.8 to 2.4 fl oz (0.014 to 0.019 lb ai/A)	7-day waiting period for grazing; 30 days for harvest.
	Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	13 to 25 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw.
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	11 to 25 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw (other names Bolton, use labeled rates).
	Fastac [3] (alpha-cypermethrin)	1.8 to 3.8 fl oz (0.012 to 0.025 lb ai/A)	14-day PHI.
	Mustang MAXX [3] (zeta-cypermethrin)	1.76 to 4.0 fl oz (0.011 to 0.025 lb ai/A)	14-day waiting period for grazing or harvesting. (other names, Respect, Respect EC)
	Proaxis 0.5 CS' [3] (gamma-cyhalothrin)	1.92 to 3.20 fl oz (0.0075 to 0.0125 lb ai/A)	Wheat, wheat hay, triticale. 30-day waiting period for harvest and fodder, 7-days for grazing harvest (other names: Declare, Prolex)
	Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	Wheat, wheat hay, and triticale. 7-day waiting period for grazing, 30 days for harvest. (other names; Grizzly, Kaiso, Silencer, Taiga)

Pest, Damage and Treatment Threshold	Insecticide, Formulation, [MOA Group] and (Active Ingredient)	Rate of Product and (lb active ingredient) per Acre	Comments
Armyworm Dark green or brown caterpillar with five stripes along body. Damage: Feed on flag leaf, awns and may "clip" heads. Threshold: Treat if four to five unparasitized armyworms are found per foot of row.	Baythroid XL [3] (beta-cyfluthrin)	1.8 to 2.4 fl oz (0.014 to 0.019 lb ai/A)	1st and 2nd instars only. 7-day waiting period for grazing, 30 days for harvest.
	Besiege [3,28] (lambda-cyhalothrin + chlorantraniliprole)	6.0 to 10 fl oz	30-day PHI.
	Blackhawk [5] (spinosad)	1.1 to 3.3 oz (0.025 to 0.075 lb ai/A)	3-day for forage or hay, 21-day waiting period for harvest.
	Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	13 to 25 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw. (other names Bolton, use labeled rates).
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	11 to 25 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw.
	Coragen [28] (chlorantraniliprole)	3.5 to 7.5 fl oz (0.045 to 0.098 lb ai)	1 day PHI.
	Fastac [3] (alpha-cypermethrin)	1.8 to 3.8 fl oz (0.012 to 0.025 lb ai/A)	14-day PHI.
	Lannate LV [1A] (methomyl)	0.75 to 1.5 pt (0.225 to 0.45 lb ai/A)	10-day waiting period for grazing, 7-day waiting period for harvest. (other names, Annihilate).
	Mustang MAXX [3] (zeta-cypermethrin)	1.76 to 4.0 fl oz (0.011 to 0.025 lb ai/A)	14-day waiting period for grazing or harvesting. (other names, Respect, Respect EC).
	Prevathon [28] (chlorantraniliprole)	14 to 20 fl oz (0.047 to 0.067 lb ai/A)	Barley, oats, triticale, wheat: 1-day PHI.
	Proaxis 0.5 CS' [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	Wheat, wheat hay, triticale. 30-day waiting period for harvest and fodder, 7-days for grazing harvest (other names: Declare, Prolex).
	Radiant [5] (spinetoram)	3 to 6 oz	21-day waiting period for grain, 4 days for forage.
	Stallion [1B, 3] (chlorpyrifos + zeta-cypermethrin)	9.25 to 11.75 fl oz	14-day waiting period for grazing, 28-days for harvest.
Brown wheat mite Tiny red to dark brown mites that feed on leaves, associated with dry, hot weather. Damage: Plants appear to be drought stricken Threshold: Treat if mites and damage are evident.	Tombstone [3] (cyfluthrin)	1.8 to 2.4 fl oz (0.028 to 0.038 lb ai/A)	3-day waiting period for grazing, 30- day for harvest.
	Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	Wheat, wheat hay, and triticale. 7-day waiting period for grazing, 30 days for harvest. (other names; Grizzly, Kaiso, Silencer, Taiga).
	Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	7 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw. (other names Bolton, use labeled rates).
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	6 to 13 fl oz	(Cobalt advanced is chlorpyrifos + lambda cyhalothrin, different rates).
	Dimethoate 4E [1B] (dimethoate)	0.33 to 0.5 pt (0.165 to 0.25 lb ai/A)	Wheat only. 14-day waiting period for grazing, 35-day waiting period for harvest. Two applications per season.
Lorsban 4E [1B] (chlorpyrifos)	0.5 to 1 pt (0.25 to 0.5 lb ai/A)	14-day waiting period for grazing, 28-day waiting period for harvest. Two applications per season. (other names, Hatchet, Warhawk).	

Pest, Damage and Treatment Threshold	Insecticide, Formulation, [MOA Group] and (Active Ingredient)	Rate of Product and (lb active ingredient) per Acre	Comments
<p>Fall armyworm Large, brown, green or black caterpillar with stripes, up to 1.5 inches. Has a light colored, inverted "Y" on head.</p> <p>Damage: Eat small plants in Fall</p> <p>Threshold: Treat if three to four larvae are found per foot of row AND feeding damage is evident. grain or</p>	Baythroid XL [3] (beta-cyfluthrin)	1.8 to 2.4 fl oz (0.014 to 0.019 lb ai/A)	1st and 2nd instars only. 7-day waiting period for grazing, 30 days for harvest.
	Besiege [3,28] (lambda-cyhalothrin + chlorantraniliprole)	6.0 to 10 fl oz	30-day PHI.
	Blackhawk [5] (spinosad)	1.7 to 3.3 oz (0.04 to 0.075 lb ai/A)	3-day for forage or hay, 21-day waiting period for harvest.
	Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	13 to 25 fl oz	14-day waiting period for forage and hay, 28-days for straw.
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	11 to 25 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw (other names Bolton, use labeled rates).
	Coragen [28] (chlorantraniliprole)	3.5 to 7.5 fl oz (0.045 to 0.098 lb ai)	1-day PHI.
	Fastac [3] (alpha-cypermethrin)	3.2 to 3.8 fl oz (0.02 to 0.025 lb ai/A)	14-day PHI.
	Lannate LV [1A] (methomyl)]	0.75 to 1.5 pt (0.225 to 0.45 lb ai/A)	10-day waiting period for grazing, 7-day waiting period for harvest.
	Mustang MAXX [3] (zeta-cypermethrin)	1.76 to 4.0 fl oz (0.011 to 0.025 lb ai/A)	14-day waiting period for grazing or harvesting. (other names, Respect, Respect EC)
	Prevathon [28] (chlorantraniliprole)	14 to 20 fl oz (0.047 to 0.067 lb ai/A)	Barley, oats, triticale, wheat: 1-day PHI.
	Proaxis 0.5 CS' [3] (gamma-cyhalothrin)	2.56 to 3.84 fl oz (0.01 to 0.015 lb ai/A)	Wheat, wheat hay, triticale. 30-day waiting period for harvest and fodder, 7-days for grazing harvest (other names: Declare, Prolex)
	Radiant [5] (spinetoram)	3 to 6 oz	21-day waiting period for grain, 4 days for forage.
Stallion [1B, 3] (chlorpyrifos zeta-cypermethrin)	9.25 to 11.75 fl oz	14-day waiting period for grazing, 28-days for harvest.	
Warrior II [3] (lambda-cyhalothrin)	1.92 fl oz (0.03 lb ai/A)	Wheat, wheat hay, and triticale. 7-day waiting period for grazing, 30 days for harvest. (other names; Grizzly, Kaiso, Silencer, Taiga)	
<p>False wireworm/Wireworm for Slender, hard bodied, wormlike larvae.</p> <p>Damage: Feed on kernels and newly germinated plants below the soil surface</p> <p>Threshold: Treat if 2 larvae are found per foot²</p>	Cruiser 5FS [4A] (thiamethoxam)	0.75 to 1.33 fl oz/cwt seed	Wheat and barley. Do not use surplus treated seed feed or food. Follow label instructions for application and storage conditions.
	Gauche 480 [4A] Gauche XT [4A] (imidacloprid)	1 to 3 fl oz/cwt seed	Wheat and barley. 45-day waiting period for grazing. Do not use treated seed as feed. (other names; Attendant, Sativa IM Max, Senator)
	Nipsit [4A] (clothianidin)	0.25 to 1.79 fl oz/cwt seed	Do not use treated seed as feed. Products are not labeled specifically for false wireworm; performance varies with soil moisture and soil temperature.

Pest, Damage and Treatment Threshold	Insecticide, Formulation, [MOA Group] and (Active Ingredient)	Rate of Product and (lb active ingredient) per Acre	Comments	
<p>Grasshopper Damage: May occur in mid-May through early June and August through October. May destroy field margins in fall, or chew leaves and clip heads in spring.</p> <p>Threshold: 11-20 per yard² in vegetation next to wheat three to seven per yard² in the field. See EPP-7196 for additional information.</p> <p>See EPP-7196: Grasshopper Management in Rangeland, Pastures and Crops</p>	Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	7 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw (other names Bolton, use labeled rates).	
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	6 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw.	
	Coragen [28] (chlorantraniliprole)	2.0 to 5.0 fl oz (0.026 to 0.065 lb ai)	1-day PHI	
	Dimethoate 4E [1B] (dimethoate)	0.75 pt (0.375 lb ai/A)	Wheat only. 14-day waiting period for grazing, 35-day waiting period for harvest. Two applications per season.	
	Lorsban 4E [1B] (chlorpyrifos)	0.5 to 1 pt (0.25 to 0.5 lb ai/A)	14-day waiting period for grazing, 28-day waiting period for harvest. Two applications per season. (other names, Hatchet, Warhawk)	
	Malathion 5EC [1B] (malathion)	1.6 pt (0.93 lb ai/A)	7-day waiting period for grazing or harvest.	
	Mustang MAXX [3] (zeta-cypermethrin)	3.2 to 4.0 fl oz (0.02 to 0.025 lb ai/A)	14-day waiting period for grazing or harvesting. (other names, Respect, Respect EC).	
	Prevathon [28] (chlorantraniliprole)	8 to 20 fl oz (0.027 to 0.067 lb ai/A)	Barley, oats, triticale, wheat 1-day PHI.	
	Sevin XLR [1A] (carbaryl)	0.5 to 1.5 qt (0.5 to 1.5 lb ai/A)	Wheat only; 21-day waiting period for harvest.	
	Stallion [1B, 3] (chlorpyrifos + zeta-cypermethrin)	5.0 to 11.75 fl oz	14-day waiting period for grazing, 28-days for harvest.	
Tombstone [3] (cyfluthrin)	1.8 to 2.4 fl oz (0.028 to 0.038 fl oz/A)	3-day waiting period for grazing; 30 days for harvest.		
<p>Greenbug Lime-green aphid with darker green stripe down back. Tips of legs, cornicles and most of antennae are black.</p> <p>Damage: Injures plants by injecting toxin, leaves turn yellow, then die. Occasional problem in fall or spring; occurs more commonly in warm, dry conditions.</p> <p>Threshold: Treatment thresholds depend on value of crop, and cost of control. To determine treatment threshold, obtain a Glance-N-Go for Greenbug sampling app at dasnr.okstate.edu/apps</p> <p>Or contact your local county OCES office for information on determining thresholds and sampling.</p>	Planting Time			
	Cruiser 5FS [4A] (thiamethoxam)	0.75 to 1.33 fl oz/cwt seed	Wheat and barley. No grazing restriction. Do not use treated seed as feed.	
	Gauche 480 [4A] Gauche XT [4A] (imidacloprid)	1 to 3 fl oz/cwt seed 3.4 fl oz/cwt seed	Wheat and barley. 45-day waiting period for grazing. Do not use treated seed as feed. (other names; Attendant, Sativa IM Max, Senator)	
	Nipsit [4A] (clothianidin)	0.75 to 1.79 fl oz/cwt seed	Do not use treated seed as feed.	
	Post-Plant			
	Cobalt [1B,3] (chlorpyrifos + gamma-cyhalothrin)	7 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw.	
	Cobalt Advanced [1B,3] (chlorpyrifos + lambda-cyhalothrin)	6 to 13 fl oz	14-day waiting period for forage and hay, 28-days for grain or straw (other names Bolton, use labeled rates).	
	Dimethoate 4E [1B] (dimethoate)	0.5 to 0.75 pt (0.25 to 0.375 lb ai/A)	Wheat only. 14-day waiting period for grazing, 35-day waiting period for harvest. Two applications per season.	
	Lorsban 4E [1B] (chlorpyrifos)	0.5 to 1 pt (0.25 to 0.5 lb ai/A)	14-day waiting period for grazing, 28-day waiting period for harvest. Two applications per season. (other names, Hatchet, Warhawk)	
	Malathion 5 EC [1B] (malathion)	1.5 pt (0.93 lb ai/A)	7-day waiting period for grazing or harvesting. (other names, Fyfanon)	
Mustang MAXX [3] (zeta-cypermethrin)	3.2 to 4 fl oz (0.02 to 0.025 lb ai/A)	14-day waiting period for grazing or harvesting. (other names; Attendant, Sativa IM Max, Senator)		