

Seed Treatments and Foliar Insecticides for Use on Winter Wheat – Update December 2010

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Which wheat pests are we concerned about?

False and True Wireworm, several species in Tenebrionidae and Elateridae families

Wireworms destroy planted seed and feed on seedling roots reducing stands and plant vigor. Wireworm damage potential is reduced when wheat is planted in enough moisture to stimulate rapid germination. Wireworms become active again in the spring but cause very little injury.

Greenbug, *Schizaphis graminum*

Greenbugs are also carriers of the virus that causes barley yellow dwarf disease. Wheat leaves react to a substance in greenbug saliva, causing young leaves to turn yellow and older leaves to develop orange-red spots. Greenbugs often occur in concentrated patches within a field, damaging small circular patches that radiate from dead spots. When abundant, greenbugs can stunt plants and eventually kill them. If seedlings are infested in the fall, they seem to be more susceptible to winter kill.

Russian Wheat Aphid, *Diuraphis noxia*

Russian wheat aphids feed on the newest growth on the plant and effectively cause cessation of chlorophyll production in those leaves. As it feeds, the Russian wheat aphid causes the leaf to curl and creates an enclosure that protects the insect from climate, natural enemies, and insecticides. Damage symptoms include white, yellow, or purple longitudinal streaks on the leaf and prostrate growth of the plant. These insect are 1/16 inch long, light green, spindle-shaped with short antennae and no prominent cornicles. It has a projection above the hind end that gives it a double-tail appearance.

Hessian Fly, *Mayetiola destructor*

The adult fly is tiny, fragile and mosquito-like and measures 1/8 inches. The legless maggot-like larvae are reddish or orange when newly hatched, but become whitish-green as they feed. When they are ready to pupate, they form a dark brown puparium, which is called a flax seed, which are normally inserted into the crown or just above the joint of a stem. This is normally the most common sign of Hessian fly infestations.

Injury is caused by larval feeding on stem tissue at the crown of young plants, or just above the nodes of jointed wheat. Young plants suffer the most serious injury, as plants become stunted, and secondary tillers that are infested fail to develop. Young plants that are infested are actually a darker green to bluish-green color, and the leaves are thicker. When larvae feed on jointed stems, they become weakened and lodge.

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Bird Cherry-oat Aphid, *Rhopalosiphum padi*

They are very efficient vectors of barley yellow dwarf virus.

It does not cause visible injury symptoms. Heavy infestations will cause plants to become sticky with honeydew, the liquid waste that is excreted by aphids as they feed.

English Grain Aphid, *Sitobion avenae*

This aphid causes the most direct damage by feeding on heads of maturing grain. The life cycle of the English grain aphid is keyed to cereal development. Eggs are deposited in the autumn on leaves of early-planted winter cereal crops, and hatch in mid-April. After several generations of asexual reproduction, winged forms are produced that disperse to spring planted wheat and late-planted winter wheat. Yield loss results from reduced number of grains per head. Spring wheat is more susceptible to English grain aphid damage because it is in an earlier stage of development than winter wheat at the time of high aphid numbers.

Winter Grain Mite, *Penthaleus major*

Mites are not true insects, but are closely related to ticks and spiders. Dark-brown, with orange-red legs and an orange or red spot on the upper abdomen. There are two generations of winter grain mite each year. The first begins in the fall, as over-summering eggs hatch. The second generation begins sometime in January, and reaches peak numbers in March. These mites feed on the leaf sheaths and shoots near the ground. They move up the plant at night and on cloudy days. Leaves take on a silvery gray color when injured and leaf tips may turn brown.

Wheat Curl Mite, *Aceria tosichella* Keifer

The wheat curl mite is approximately 1/100 inch long, white, sausage-shaped and has four small legs on the front. They reproduce most rapidly at temperatures between 75 and 80 degrees F. They crawl very slowly and depend almost entirely on wind for dispersal. The mite is most active during warm weather and moves mostly on warm, southwesterly winds. Mite feeding cause leaves to roll, taking on an onion-leaf appearance. But, they are vectors of wheat streakmosaic, wheat mosaic virus (formerly called High Plains virus), and triticum mosaic virus which can severely damage wheat.

Brown Wheat Mite, *Petrobia latens* (Müller)

Brown wheat mites are about the size of the period at the end of this sentence and are considerably smaller than the winter grain mite. Its rounded body is metallic dark brown with a few short hairs on the back. The front legs are about twice as long as the other three pairs of legs. It is most prevalent in dry weather, and populations increase when wheat suffers from deficient moisture. The brown wheat mite occurs throughout the High Plains and Rolling Plains. Miticides may not economically control this pest if the crop is unable to respond because of dry conditions.

White grub, *Phyllophaga* spp. & *Cyclocephala* spp.

White grubs are the larval stage of May or June beetles. Larvae are “c-shaped” with white bodies and tan to brown heads. Larvae feed on roots and may cause stand loss. As soil temperature decreases in the fall, white grub feeding decreases, and larvae migrate deeper in the soil. Delayed planting may improve establishment.

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Common seed treatments containing insecticides labeled for use on winter wheat.

Trade Name Company	Common Chemical name	% Active Ingredient	Rate	Additional label Information
Cruiser 5FS Syngenta	thiamethoxam	47.6%	1.0 fl oz. / 100 lb. of seed	Early season protection of seedlings against injury by Aphids (including Bird cherry-oat, English grain, Greenbug, and Russian wheat aphid) Wireworms and Hessian fly. While there are no registered insecticides for white grub control in wheat, limited field tests suggest that Cruiser® seed treatments are effective.
CruiserMaxx Cereals Syngenta	thiamethoxam mefenoxam difenoconazole	2.80% 0.56% 3.36%	5.0 fl oz / 100 lb of seed	Insect Control: Provides suppression of wireworm activity. For protection against aphids and Hessian fly an additional amount of Cruiser 5FS must be mixed with CruiserMaxx Cereal. Mix 5.0 fl oz of Cruiser Maxx Cereal with 0.48 to 1.0 fl oz of Cruiser 5FS per 100 lb of seed. While there are no registered insecticides for white grub control in wheat, limited field tests suggest that Cruiser® seed treatments are effective Disease Control: For control of the following seed and soil-borne diseases of wheat: general seed rot, seedling blight, root rot,damping-off caused by seed- and soil-borne <i>Fusarium</i> and soil-borne <i>Pythium</i> , common and dwarf Bunt, and loose smut. Suppression of common root rot (<i>Cochliobolus</i> spp.), early season <i>Rhizoctonia</i> root rot, <i>Fusarium</i> crown and foot rot, and take-all disease. DO NOT apply a neonicotinoid insecticide to any crop which has been grown from Cruiser Maxx Cereals treated seed.
Sativa IM Max Nufarm	imidacloprid metalaxyl tebuconazole	11.374% 0.607% 0.455%	3.4 to 5.0 fl oz / 100 lb of seed	Insect Control: Early season protection of seedlings against injury by Aphids (including Bird cherry-oat, English grain, Greenbug, and Russian wheat aphid) Wireworms and Hessian fly. While there are no registered insecticides for white grub control in wheat, limited field tests suggest that imidacloprid seed treatments are effective Disease Control: Early season disease control of <i>Pythium</i> damping-off, stinking smut, flag smut, loose smut, <i>Septoria</i> disease complex, <i>Rhizoctonia</i> root tor; common root rot, <i>Fusarium</i> foot rot,powdery mildew, and suppression of wheat leaf rust. Application Directions: Apply prior to planating as a slurry treatment. DO NOT graze or feed livestock on treated areas for 45 days after planting.
Enhance AW Chemtura AgroSolutions	Imidacloprid Captan carboxin	20.0% 19.55% 20.0%	4 oz / 100 lbs of seed	Insect Control: Provides early season protection of seedlings against injury by Aphids (including Bird cherry-oat, English grain, Greenbug, and Russian wheat aphid). Suppresses early season Hessian fly damage, and wireworm activity on seed and young seedlings. Disease Control: Controls common bunt or stinking smut. Protects seed from seed borne and soil borne fungi that cause seed decay, damping-off, and seedling blights (including <i>Fusarium</i> , <i>Cochliobolus sativus</i> , <i>Rhizoctonia</i> and <i>Pythium</i>) for all labeled crops. DO NOT graze or feed livestock on treated areas for 45 days after planting.
DynaShield Imidacloprid 5 Loveland Imida E Ag 5 FST Etigra Gaucho 600 Flowable Bayer CropScience Senator 600 FS Nufarm	imidacloprid	48.7%	0.8 to 2.4 fl oz / 100 lb of seed Aphid and Hessian fly 0.13 tp 0.26 fl oz / 100 lb of seed Wireworm 1.2 to 2.4 fl oz per 100 lb of seed Grashopper	Provides early season protection of seedlings against injury by Aphids (including Bird cherry-oat, English grain, Greenbug, and Russian wheat aphid)., Hessian fly Low use rate for “wireworm-only” protection for suppression of wireworm activity on seed and young seedlings To reduce early season damage caused by grasshopper plant treated seed as a 50 foot border around the edges of the field. DO NOT graze or feed livestock on treated areas for 45 days after planting

Common foliar insecticides labeled for use on winter wheat. Other generic products may be available for some insecticides.

Common Chemical name	Trade Name	Rate Amount per acre	Additional label Information
Carbaryl	Sevin XLR Plus Sevin 4-Oil Sevin 80S	1-1.5 qt 1-1.5 qt 1.25-1.875 lb	For control of Fall armyworms and Armyworms
	Sevin XLR Plus Sevin 4-Oil Sevin 80S	0.5-1.5 qt 0.5-1.5 qt 0.625-1.875 lb	For control of Grasshoppers
	Sevin XLR Plus Sevin 4-Oil Sevin 80S	0.5-1.0 qt 0.5-1.5 qt 0.625-1.25 lb	For control of Flea Beetles
			Waiting period (days) to harvest is 21 and grazing is 7 for Sevin XLR Plus and Sevin 80 S. For Sevin 4-Oil the waiting period (days) to harvest is 21 and grazing is 0.
Chlorpyrifos	Chlorpyrifos 4E Ag, Lorsban 4E,4E-SG, and Nufos 4E	0.5-1 pt	For control of Greenbug, Russian Wheat Aphid, English Grain Aphid, Brown Wheat Mite, and Grasshoppers
		1 pt	For control of Army cutworms and suppression only of other cutworm spp. Labeled for use on wheat only. Do not make more than two applications per crop. Waiting period (days) to harvest is 28 and grazing is 14.
Chlorpyrifos + <i>Gamma</i> -Cyhalothrin	Cobalt	7-13 fl oz	For control of Greenbug, Russian Wheat Aphid, Oat Bird-Cherry Aphid, English Grain Aphid, Brown Wheat Mite, and Grasshoppers
		13-25 fl oz	For control of Army Cutworms, Armyworms, Cereal Leaf Beetle, Cutworms, Flea Beetles,
		19-25 fl oz	For control of Stink Bug spp. DO NOT make more that 2 applications of Cobalt or products containing chlorpyrifos per season Do not graze treated areas or harvest treated forage within 7 days after last treatment and do not feed treated straw within 30 days after the last treatment.
<i>Beta</i> -Cyfluthrin	Baythroid XL	1.0-1.8 fl oz	For control of Army Cutworm and Cutworm spp.
		1.8-2.4 fl oz	For control of Fall armyworms, Armyworms, Bird Cherry-Oat Aphid, English Grain Aphid, Russian Wheat Aphid, Grasshoppers, Flea Beetles, Southern armyworm, Stink Bugs, Yellowstriped Armyworm, and Pale Western cutworm
		2.4 fl oz	For control of Chinch Bug Labeled for use on barley, buckwheat, millet, oat, rye, triticale and wheat. Do not apply more than 4.8 fluid ounces per acre per season. Waiting period (days) to harvest is 30 and grazing or foraging is 3.
Dimethoate	Dimethoate 2.67	0.75-1 pt	For control of Greenbug and Russian Wheat Aphid
	Dimethoate 4E and Dimate 4EC	0.5-0.75 pt	
	Dimethoate 2.67	0.75-1 pt	For control of Brown Wheat Mite
	Dimethoate 4E and Dimate 4EC	0.5-0.75 pt	
			Labeled for wheat and triticale only. For both formulations the waiting period (days) to harvest is 35 and grazing is 14.
<i>Gamma</i> -Cyhalothrin	Proaxis	1.92-3.2 fl oz	For control of Army Cutworm and Cutworm spp.
		2.56-3.84 fl oz	For control of Fall armyworms, Armyworms, English Grain Aphid, Flea Beetles, Grasshopper spp., Oat Bird-Cherry Aphid, Russian Wheat Aphid, and Stink Bug spp., and Yellowstriped Armyworms
		3.84 fl oz	For control of Greenbug, Mite spp., Chinch Bug and Corn Leaf Aphid Labeled for wheat, wheat hay and triticale. Do not apply more than 0.48 pints per

			acre per season. Waiting period (days) to harvest is 30 and grazing is 30.
<i>Gamma-Cyhalothrin</i>	Declare 1.25	0.77-1.28 fl oz 1.02-1.54 1.54	For control of army cutworm and cutworm spp. For control of Armyworms, cereal leaf beetle, English grain aphid, Fall armyworms, Flea Beetle spp., Grasshopper spp., Hessian fly, Oat Bird-Cherry Aphid, Russian Wheat Aphid, Stink Bug spp., and Yellowstriped Armyworm For control of Chinch bug, Corn Leaf Aphid, Greenbug, and Mite spp. Labeled for wheat, wheat hay, and triticale. Preharvest interval is 30 days. Do not allow livestock to graze in treated areas or harvest treated wheat forage as feed for meat or dairy animals within 7 days after last treatment, Do not feed treated straw to meat or dairy animals within 30 days after the last treatment.
<i>Lambda-Cyhalothrin</i>	Warrior	1.92-3.2 fl oz 2.56-3.84 fl oz 3.84 fl oz	For control of Cutworms For control of Fall armyworms, Armyworms, Russian Wheat Aphid, Beet Armyworms, Grasshoppers, Flea Beetles For control of Greenbug, Brown Wheat Mite, and Chinch Bugs and False Chinch Bugs Labeled for wheat, wheat hay and triticale. Do not apply more than 0.48 pints per acre per season. Waiting period (days) to harvest is 30 and grazing is 30.
<i>Lambda-Cyhalothrin</i>	Karate with Zeon Technology	1.92 fl oz	For control of Greenbug, Chinch Bug, and suppression of Corn Leaf Aphid and Mite spp. Labeled for wheat, barley, oats, rye, triticale, and wheat hay. Preharvest interval is 30 days. Do not graze livestock in treated areas or harvest treated wheat forage within 7 days after treatment. Do not feed treated straw within 30 days after the last harvest. Do not apply more than 3.84 fl. oz. per season.
Malathion	Malathion (5 lb) Fyfanon ULV	0.5 pt 0.5-2 pt 1.5-2pt 2 pt 8 fl oz	For control of Greenbug. Not as effective as disulfoton or methyl parathion, but may be used where a less toxic material is preferred for ground applications. For control of Winter Grain Mite. For control of Grasshoppers For control of Beet Armyworms For control of Grasshoppers For both formulations the waiting period (days) to harvest is 7 and grazing is 7.
Methomyl	Lannate SP Lannate LV	0.25-0.5 lb 0.75-1.5 pt	For control of Armyworms, and Aphids For both formulations the waiting period (days) to harvest is 7 and grazing is 10.
Spinosad	Tracer	1.5-3 fl oz	For control of Armyworms, Corn Earworm (headworm), and suppression of Grasshoppers Labeled for wheat, barley, oats, rye, and triticale. Do not apply within 21 days of grain or straw harvest or within 3 days of forage, fodder, or hay harvest. Do not allow cattle to graze treated area until spray has dried.
Zeta-cypermethrin	Mustang Max, Mustang Max EC	1.28-4 fl oz 1.76-4 fl oz 3.2-4 fl oz	For control of Cutworms spp. For control of True Armyworm, Southern Armyworm, Yellowstriped Armyworm, Flea Beetles For control of Fall armyworms , Armyworms (Beet and Fall), Greenbug, Aphid spp., Beet armyworms, Chinch Bugs and False Chinch Bugs, and Grasshoppers Labeled for wheat and triticale. Do not apply more than 20 ounces per acre per season. Waiting period (days) to harvest for grain, forage, and hay is 14 and grazing is 14.

