2020 Sorghum Insect Control Recommendations

Introduction

Grain sorghum is a minor rotational crop in Tennessee. Sorghum is more drought-tolerant than either corn or soybeans, and provides another non-host crop for managing soybean cyst nematode populations. Grain sorghum can be used in a double-crop system following wheat or as a late-planted grain crop.

Several pests may reduce yield, and sorghum should be routinely scouted for insects and other problems. By planting grain sorghum in the recommended planting window, some insect problems can be reduced or avoided. Infestations of the sorghum midge, corn earworm, fall armyworm and sorghum webworm will typically cause more damage to late-planted sorghum. Fortunately, there are many insecticides that will control economically damaging populations of sorghum insect pests.

Sap-feeding Insects
Different types of aphids may be found on grain sorghum early in the season. These insects are found on top and underneath the leaves and whorls of sorghum plants, where they cause damage by sucking juices from the plant. The most common aphids found in grain sorghum are the sugarcane aphid, corn leaf aphid, and greenbug. The greenbug can be a serious pest of seedling plants, and the sugarcane aphid is a serious pests later in the season (see below).

Insects Feeding on Grain Heads and Seed Kernels
The sorghum midge and sorghum webworm feed on the ripening grain kernels. Sorghum webworms feed on the ripening kernels by devouring the inside and leaving the hollow kernel shell. Corn earworms and fall armyworms usually consume the entire kernel as they feed.

Insects Feeding on Leaf Tissue
Corn earworms and fall armyworms feed in the whorls of young grain sorghum plants. Severe feeding injury to the growing point or intercalary meristem may destroy the emerging grain head.

Recommended Planting Dates
Grain sorghum should be planted from May 1 to June 1 for highest yields. Planting before mid-May will avoid some insect damage from sorghum midge, fall armyworm, sorghum webworm and corn earworm.

Insecticide Seed Treatments
Insecticide seed treatments such as Cruiser (thiamethoxam) and Poncho (clothianidin) are available from seed companies. Seed treatments will help control some seed and seedling pests such as chinch bug, greenbug, wireworms and white grubs. However, there has been little testing of these treatments in Tennessee. Recent data indicates that these insecticide seed treatments may reduce infestations of sugarcane aphid, which may be especially important on late-planted sorghum.

Aphids

Several species of aphids may be found on grain sorghum. These insects damage by sucking juices from the plant, and some inject a toxin that can kill plant tissue while feeding. The most common aphids found in grain sorghum are the corn leaf aphid and sugarcane aphid.

The corn leaf aphid has black cornicles, legs and antennae. The body is bluish-green in color and about 1/16 inch long. Corn leaf aphids are usually found feeding in the whorl of the sorghum plant. Check primarily in the whorls of sorghum plants for this insect. The corn leaf aphid does not inject a toxic saliva into the leaves, but it can transmit maize dwarf mosaic virus if Johnsongrass is present in the field.

The greenbug aphid is a small, light green aphid with a dark green stripe down the back. It is approximately 1/16 inch long. Early-planted sorghum is more susceptible to attack from greenbug. The greenbug has a toxic substance in its saliva that causes red spots on leaves where it has fed. It can also transmit viral diseases like maize dwarf mosaic virus.

The yellow sugarcane aphid is a small aphid that is yellow to light green in color, although usually yellow in sorghum. They have two double rows of dusky colored spots down the top of the abdomen, and rows of spots are also present along the lateral margins of the abdomen. The body is covered with short, stiff hairs. The cornicles (tail-pipes at the end of the abdomen) are reduced to slightly elevated pores. Like the greenbug, the yellow sugarcane aphid injects a toxin while feeding that causes red spots on leaves where it has fed.

The sugarcane aphid is an invasive pest first found in Tennessee in 2014. Of the aphids that infest sorghum, they are most likely to cause serious economic damage. It is small and white to yellow in color. Infestations are often initially concentrated on field edges. Populations can build rapidly and may kill entire plants in some circumstances. The accumulation of honeydew on heads may also cause problems during harvest.

Sampling: Sample for aphids by visually examining plants. Aphids are most commonly found on the undersides of leaves, but corn leaf aphids often specifically congregate in the whorls. Aphids excrete honeydew as they feed, and sticky and shiny leaves often indicate high populations of corn leaf aphids or sugarcane aphids.

Because sugarcane aphids do not survive the winter in Tennessee, populations migrate in from more southern regions each year. Thus, serious infestations typically have not occurred until July or later. Sugarcane aphid infestation are almost always worse and first detected on field edges, thus, edge sampling can be used to detect the presence or absence of this pests. Once detected, randomly sample several areas of the field every 4-5 days.

Treatment Thresholds:

Corn leaf aphid. Sorghum plants can tolerate large numbers of corn leaf aphids, and treatment is usually unnecessary.

Greenbug and yellow sugarcane aphids. Treatment for greenbug and yellow sugarcane aphids is most likely during the seedling stage. Treat when one or two aphids are on the majority of plants during the seedling stage (less than 3-4 true leaves) and leaves are showing injury. For larger plants, treat when 1-2 leaves are dying on most plants.

Sugarcane aphid. Current recommendations are to treat when aphids are present on 30 percent or more of plants and occasional leaves have 100 or more aphids present. Treatment should also be considered if honeydew is present in multiple spots throughout the field and aphid populations are increasing. Unlike the other aphid species, treatment may be needed until near crop maturity because serious infestations can cause an accumulation of honeydew and sooty mold that interferes with harvest.

- **Insecticide seed treatments such as Cruiser, Gaucho and Poncho can suppress early-season aphid infestations for 30 days or longer.**
- **Early planting substantially reduces the risk of sugarcane aphid infestations.**

- **Varieties with tolerance to sugarcane infestations are available and should be used providing they have adequate yield potential.**

Insecticide (Trade Name) for APHIDS	Lb Active Ingredient per Acre	Amount Formulation per Acre	Performance Rating
Aphids Except Sugarcane Aphid			
chlorpyrifos (Lorsban 4, Nufos 4)	0.25 - 1	8 - 32 oz	8
chlorpyrifos (Lorsban Advanced 3.775)	0.24 - 0.94	8 - 32 oz	8
chlorpyrifos, γ-cyhalothrin (Cobalt Advanced)	See label	11 - 38 oz	8
dimethoate 4	0.25 - 0.5	8 - 16 oz	8
Sugarcane and Other Aphids			
flupyradifurone (Sivanto Prime 1.67)	0.15 - 0.09	4 - 7 oz	9
sulfoxaflor (Transform 50WG)	0.031 - 0.047	1 - 1.5 oz	8

Corn Earworm

Corn earworm larvae are a common pest of grain sorghum. The larva has alternating light and dark stripes and tiny spines down the length of the body. The color of larvae varies considerably, but the head capsule is a creamy yellow. Full grown larvae are about 1½ inches long. Corn earworms will feed in the whorls of young plants, like fall armyworm. However, feeding on the kernels of grain heads is more likely to cause economic damage.

Sampling: Check in the whorls of young plants and the grain heads of older plants. Examine a minimum of 50 plants throughout the field. Sets of 10 heads can be briskly shaken into a bucket or sweep net. Carefully look through the debris for larvae of all sizes. Fall armyworm or sorghum webworm will also be found feeding in heads. Frass (worm poop) often accumulates in the collars of upper leaves if large larvae are present.

Treatment Thresholds: Treatment is recommended when an average of one or more larvae is found per plant.

- **Planting early, before mid-May, may help avoid some damage from corn earworm and fall armyworm.**

Insecticide (Trade Names) for CORN EARWORM	Lb Active Ingredient per Acre	Amount Formulation per Acre	Performance Rating
carbaryl (Sevin 80S)	1 - 2	1.25 - 2.5 lb	5
carbaryl (Sevin XLR 4)	0.5 - 1	16 - 32 oz	5
chlorantraniliprole (Prevathon 0.43 SC)	0.05 - 0.07	14 - 20 oz	9
chlorantraniliprole, λ-cyhalothrin (Besiege)	See label	6 - 10 oz	9
chlorpyrifos (Lorsban 4, Nufos 4)	1	32 oz	5
chlorpyrifos (Lorsban Advanced 3.775)	0.94	32 oz	5
chlorpyrifos, γ-cyhalothrin (Cobalt Advanced)	See label	16 - 38 oz	7
chlorpyrifos, Z-cypermethrin (Stallion)	See label	5 - 11.75 oz	7
methomyl (Lannate LV 2.4)	0.45	24 oz	7
NPV virus (Heligen) *	See label	1 - 1.4 oz	6
spinosad (Blackhawk 36% WDG)	0.038 - 0.074	1.7 - 3.3 oz	6
esfenvalerate (Asana XL 0.66) **	0.015 - 0.03	2.9 - 5.8 oz	6
β-cyfluthrin (Baythroid XL 1) **	0.01 - 0.02	1.3 - 2.8 oz	6
γ-cyhalothrin (Declare 1.25) **	0.01 - 0.015	1.02 - 1.54 oz	6
λ-cyhalothrin (Warrior II 2.08) **	0.02 - 0.03	1.23 - 1.85 oz	6
Z-cypermethrin (Mustang Max 0.8) **	0.01 - 0.025	1.76 - 4 oz	6

* NPV virus (Heligen) will only control corn earworm. Applications should be made when larvae are small. Do not apply if most larvae are large or if infestations are well above treatment threshold.
** Pyrethroid insecticides may not provide adequate control of corn earworm or fall armyworm and are not recommended if infestations are well above treatment threshold.

Fall Armyworm

Fall armyworm larvae are commonly found feeding in the whorls of sorghum and also feed on the grain of older plants. Larvae generally have a dark head capsule and a prominent, light-colored inverted Y on the front of the head. The body color is greenish to brownish with dark stripes along its length. It has relatively few tiny spines (setae) on the body, contrasting it with the corn earworm.

Sampling: Check in the whorls of young plants and the grain heads of older plants. Examine a minimum of 50 plants throughout the field. Sets of 10 heads can be briskly shaken into a bucket or sweep net. Carefully look through the debris for larvae of all sizes. Corn earworm or sorghum webworm will also be found feeding in heads. Frass (worm poop) often accumulates in the collars of upper leaves if large larvae are present.

Treatment Thresholds: Treatment is recommended when an average of one or more larvae is found per plant, either in the whorl or head stage.

- **Planting early, before mid-May, will generally help avoid some damage from fall armyworm and corn earworm.**

Insecticide (Trade Names) for FALL ARMYWORM	Lb Active Ingredient per Acre	Amount Formulation per Acre	Performance Rating
carbaryl (Sevin 80S)	1 - 2	1.25 - 2.5 lb	7
carbaryl (Sevin XLR 4)	1 - 2	32 - 64 oz	7
chlorantraniliprole (Prevathon 0.43 SC)	0.05 - 0.07	14 - 20 oz	9
chlorantraniliprole, λ-cyhalothrin (Besiege)	See label	6 - 10 oz	9
chlorpyrifos (Lorsban 4, Nufos 4)	0.5 - 1	16 - 32 oz	7
chlorpyrifos (Lorsban Advanced 3.775)	0.47 - 0.94	16 - 32 oz	7
chlorpyrifos, γ-cyhalothrin (Cobalt Advanced)	See label	24 - 38 oz	7
chlorpyrifos, Z-cypermethrin (Stallion), suppression	See label	9.25 - 11.75 oz	7
methomyl (Lannate LV 2.4)	0.225 - 0.45	12 - 24 oz	8
methoxyfenozide (Intrepid 2F)	1 - 1.25	8 - 10 oz	8
spinosad (Blackhawk 36% WDG)	0.038 - 0.074	1.7 - 3.3 oz	8
β-cyfluthrin (Baythroid XL 1) *	0.01 - 0.02	1.3 - 2.8 oz	5
γ-cyhalothrin (Declare 1.25) *	0.01 - 0.015	1.02 - 1.54 oz	5
λ-cyhalothrin (Warrior II 2.08) *	0.02 - 0.03	1.23 - 1.85 oz	5
Z-cypermethrin (Mustang Max 0.8) *	0.01 - 0.025	1.76 - 4 oz	5

* Pyrethroid insecticides may not provide adequate control of corn earworm or fall armyworm and are not recommended if infestations are well above the treatment threshold.

Sorghum Midge

Serious infestations of sorghum midge are relatively uncommon in Tennessee, but they can be very damaging. Sorghum midge is a small, gnat-like insect that is reddish-orange and about 1/10-inch long. Female sorghum midges lay eggs only during the bloom stage. Eggs are laid in the spikelets between the glumes of a floret. The larvae feed on the developing seeds, causing them to dry up and die.

Sampling: Once grain heads are present, check for sorghum midge throughout bloom every 4-5 days. You can visually look for the reddish-orange flies, but a preferred method is to place a clear plastic bag over the head and shake, looking for midges that land on the plastic. Examine a minimum of 50 heads field in randomly selected areas of the field.

Treatment Thresholds: During flowering, once 20-30 percent of heads are blooming, treat when an average of one midge is found per head. More than one treatment may be needed in some cases.

- **Insecticide applications are made to control adults and prevent egg laying because larvae are hidden from insecticides.**
- **Planting early, before mid-May, may help avoid some damage from sorghum midge.**
- **Sorghum midge are often worse in sorghum next to earlier maturating fields that serve as a source of infestations.**
- **Johnsongrass is an alternative host that may serve as a nursery for sorghum midge. Maintaining good weed control in and around a field can reduce infestations.**

Insecticide (Trade Names) for SORGHUM MIDGE	Lb Active Ingredient per Acre	Amount Formulation per Acre	Performance Rating
chlorpyrifos (Lorsban 4, Nufos 4)	0.25	8 oz	6
chlorpyrifos (Lorsban Advanced 3.775)	0.24	8 oz	6
chlorpyrifos, γ-cyhalothrin (Cobalt Advanced)	See label	6 - 13 oz	8
chlorpyrifos, Z-cypermethrin (Stallion)	See label	3.75 - 11.75 oz	8
methomyl (Lannate LV 2.4)	0.225 - 0.45	12 - 24 oz	6
esfenvalerate (Asana XL 0.66)	0.015 - 0.03	2.9 - 5.8 oz	8
spinosad (Blackhawk 36% WDG), suppression	0.034 - 0.074	1.5 - 3.3 oz	5?
β-cyfluthrin (Baythroid XL 1)	0.008 - 0.01	1 - 1.3 oz	8
γ-cyhalothrin (Declare 1.25)	0.0075 - 0.01	0.77 - 1.02 oz	8
λ-cyhalothrin (Warrior II 2.08)	0.015 - 0.02	0.92 - 1.23 oz	8
Z-cypermethrin (Mustang Max 0.8)	0.008 - 0.025	1.28 - 4 oz	8

Sorghum Webworm

The sorghum webworm is a hairy caterpillar with four reddish-brown stripes down its back. Full-grown larvae are only about ½ inch long. They are commonly seen feeding on grain in developing heads. They are usually associated with a sticky webbing in the area of their feeding.

Sampling: Check grain heads for larvae. Examine a minimum of 50 plants throughout the field. Sets of 10 heads can be briskly shaken into a bucket or sweep net. Carefully look through the debris for larvae. Corn earworm or fall armyworm will also be found feeding in heads.

Treatment Thresholds: During heading, treat when an average of 3-4 or more larvae is found per grain head.

- **Planting early, before mid-May, may help avoid some damage from sorghum webworm.**
- **Resistance to pyrethroid insecticides in well documented and has been observed in Tennessee. Use alternative chemistries is generally suggested.**

Insecticide (Trade Names) for SORGHUM WEBWORM	Lb Active Ingredient per Acre	Amount Formulation per Acre	Performance Rating
carbaryl (Sevin 80S)	1 - 2	1.25 - 2.5 lb	7
carbaryl (Sevin XLR 4)	0.5 - 1	16 - 32 oz	7
chlorantraniliprole (Prevathon 0.43 SC)	0.05 - 0.07	14 - 20 oz	9
chlorantraniliprole, λ-cyhalothrin (Besiege)	See label	6 - 10 oz	9
chlorpyrifos (Lorsban 4, Nufos 4)	0.5 - 1	16 - 32 oz	7
chlorpyrifos (Lorsban Advanced 3.775)	0.47 - 0.94	16 - 32 oz	7
chlorpyrifos, γ-cyhalothrin (Cobalt Advanced)	See label	16 - 38 oz	7
chlorpyrifos, Z-cypermethrin (Stallion)	See label	5 - 11.75 oz	7
methomyl (Lannate LV 2.4)	0.45	24 oz	7
spinosad (Blackhawk 36% WDG)	0.038 - 0.074	1.7 - 3.3 oz	9

Stink Bugs

Several species of stink bugs including the rice stink bug and brown stink bug will attack sorghum during grain fill. Although treatment is only occasionally needed, feeding can affect grain quality and yield. Sorghum is most susceptible when the grain is in the milk and soft dough stage.

Sampling: Visually examine at least 50 heads in throughout the field for adult and immature stink bugs, or sets of 10 heads can be briskly shaken into a bucket or sweep net to check for insects.

Treatment Thresholds: Treat when an average of five or more stink bugs per head is found from flowering to soft dough. When sorghum reaches hard dough stage, treat when an average of 16 or more stink bugs is found per head.

Insecticide (Trade Names) for STINK BUGS	Lb Active Ingredient per Acre	Amount Formulation per Acre	Performance Rating
carbaryl (Sevin 80S)	1.2 - 2	1.5 - 2.5 lb	5
carbaryl (Sevin XLR 4)	1 - 2	38 - 64 oz	5
chlorpyrifos, γ-cyhalothrin (Cobalt)	See label	16 - 38 oz	7
chlorpyrifos, Z-cypermethrin (Stallion)	See label	5 - 11.75 oz	7
β-cyfluthrin (Baythroid XL 1)	0.01 - 0.02	1.3 - 2.8 oz	7
γ-cyhalothrin (Declare 1.25)	0.01 - 0.015	1.02 - 1.54 oz	7
λ-cyhalothrin (Warrior II 2.08)	0.02 - 0.03	1.23 - 1.85 oz	7
Z-cypermethrin (Mustang Max 0.8)	0.01 - 0.025	1.76 - 4 oz	7

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