Cotton INSECT PEST MANAGEMENT *2025*

K-STATE Research and Extension
Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

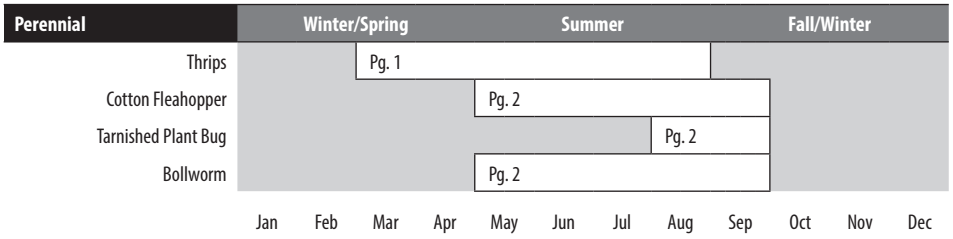
How to Use This Guide

This publication was prepared to help producers manage insect populations in Kansas cotton fields. The information was correct at the time of printing, but labels frequently change without warning. It is impractical to include all of the usage, safety and precautionary statements for any given product in this publication. Users should check labels carefully before applying a product to ensure safe and legal use.

Remember that illegal contamination of the treated crop or commodity can occur if pesticides are misused. K-State entomologists assume no responsibility for product performance, personal injury, property damage or other types of loss resulting from the purchase, handling or use of the pesticides listed.

As with all pesticides, the user bears responsibility for correct use. If there is any question about the intended use, contact the manufacturer of the product, K-State Research and Extension, or the Kansas Department of Agriculture before applying. Always read and follow label directions carefully. Never use a pesticide when the validity of the label or the intended use is in doubt. The mention of commercial products in this publication does not imply approval to the exclusion of other similar products.

Kansas cotton growers escape most of the damaging insects found deeper in the Cotton Belt. But there are potential pests, and growers need to watch for signs and symptoms of developing problems. While information from other cotton-growing states may help identify and manage many of these problems, local growing conditions and yield expectations require management recommendations and will probably need to be adjusted for Kansas. Inputs for managing insect pests must balance a short growing season and limited yield potential. The potential for insect damage must be compared to the crop's yield potential in relation to the time of the season. The following are a few of the insect problems that have been identified in Kansas cotton and some management considerations.



Using Insecticides Safely

Injury or death can result from swallowing, inhaling or prolonged skin contact with insecticides. The risk of injury from ingestion is greatest among pets, livestock and young children. Skin absorption and sometimes inhalation usually pose the greatest risk to users. Handle all pesticides with care and use only when needed. Avoid spilling concentrates on the skin or clothing.

If a spill occurs, remove contaminated clothing immediately, and wash with soap and water. For pesticide in the eyes, flush with water for 15 minutes and seek prompt medical attention. If exposed and in need of medical treatment, take the pesticide label with you. Contact the Mid-America Poison Control Center emergency number at 800-222-1222 for poison control information.

Pesticide applicators should wear protective equipment (respirators and clothing) as specified on the product label. Bathe and change clothes frequently. Launder contaminated clothing separately from the rest of the wash.

Protect fish, wildlife and other nontarget organisms. Do not dispose of unused pesticides where runoff can contaminate streams, lakes, or drinking water supplies, or apply in a manner that could pollute such sites.

Consider the presence of honeybees before applying insecticides. Avoid drift to beehives or adjacent blooming crops. Notify the bee owner before making applications in the vicinity. Apply treatments late in the day when bees are not foraging to reduce the risk. Read the label carefully. It is a legal document that tells what, where, how and when the product can be used.

Thrips

The most consistent insect-related challenge for Kansas cotton growers is thrips. These tiny, barely visible, splinter-like insects are important pests during the first couple of weeks after plants emerge. They can retard growth but also are sometimes blamed for more damage than they cause.

Thrips are less than 2 millimeters long and vary in color from yellow to brown to gray. Adults have two pairs of narrow wings fringed with long hairs. They have rasping-sucking mouthparts, so they rasp the plant tissue and suck the liquids from individual plant cells.

Most thrips problems in Kansas cotton seem to be related to thrips migrating from wheat as it matures in the spring. This may cause a burst of thrips activity that is particularly damaging if it occurs as cotton plants emerge.

Thrips cause most damage to seedling cotton when dry conditions delay growth. Leaves may turn brown on the edges, develop a silvery color, or become distorted and curl upward. Light thrips infestations tend to delay plant growth and retard maturity. Heavy infestations can kill terminal buds or even entire plants. Damaged terminal buds cause abnormal branching patterns. The duration and intensity of thrips infestations vary

greatly by season and geographic location. Cotton plants outgrow thrips damage and recover when they are four to six weeks old.

Scouting for thrips can be difficult, but it is important to detect significant populations before economic damage occurs. Start looking for thrips as soon as plants begin to emerge, especially in the newest growth. Shake plants over a piece of white paper. If you see small, slender objects crawling, these are usually thrips. If there is residue of sand or soil on the plants, the thrips will be more difficult to see. Windy conditions require pulling some plants, placing them in a plastic bag, taking them out of the wind and examining the plants for thrips in the terminals and on the underside of the first two leaves. Look for early signs of damage. Thrips feeding in the terminal tissue make new leaves appear ratty.

Populations of more than one thrips per true leaf up to the six-leaf stage may justify treatment, depending on growing conditions. Control is rarely necessary later in the season.

Chemical efficacy varies by species of thrips being treated. Some populations express resistance to some materials. If one product does not seem to be working, try a different insecticide. If cotton is treated with a systemic insecticide at planting, it should be scouted for thrips two weeks after plants emerge. If live, immature thrips are found, it means that thrips are laying eggs in the field and residual properties of the seed treatment have elapsed. Follow-up foliar application may be necessary.

The use of seed treatments to prevent thrips damage has been shown to provide good economic returns in cotton, especially in southern states. Alternatives include planting-time applications of acephate and phorate; or foliar treatments of dimethoate at a low rate from 0.12 to 0.25 lb. a.i./acre or acephate at 0.18 lb. a.i./acre.

Cotton Fleahopper

If small squares (immature flower buds) turn brown and drop to the ground, the problem could be physiological or the damage may be caused by fleahoppers. If more than 10 to 20 percent of the small squares are lost in pre-bloom cotton, examine plants for fleahoppers. A fleahopper is a ⅛-inch long, yellowish-green insect. It has an elongated, oval-shaped body that is slightly flattened over the top. Adult fleahoppers have a few dark spots near the rear of the upper surface of the back. Nymphs may be white to light green, small and appear to be all legs and antennae. Alternate hosts are croton and silverleaf nightshade, so damaging infestations are more likely where these weeds are abundant.

Begin scouting for fleahoppers when cotton reaches the six-leaf stage. Scouting may be difficult because adults jump from plants if they see a shadow. During the first three weeks of squaring, the economic threshold is approximately 25 to 40 fleahoppers per 100 terminals with 10 to 15 percent blasted squares. Fleahoppers are not uncommon in Kansas cotton fields, but populations often remain below threshold levels. Other sampling techniques involve the use of a drop cloth or sweep net. When sampling with a drop cloth, place the drop cloth between the rows, and shake plants vigorously over the cloth. Consider treatment when counts range between one bug per 1 foot of row to one bug per 3 feet of row. With a sweep net, the threshold ranges between 1 and 1½ bugs per 10 sweeps.

These insects attack tiny squares, so if 75 percent or more squares are retained, there is probably not a significant fleahopper population. Because of the short growing season in Kansas, treating fleahoppers in August after bloom begins is often not economical. In most cases, the limited potential for late-developing squares to enhance yields, coupled with the chance of unleashing bollworms by killing beneficial insects, offset the advantages of protecting later squares if a late-season fleahopper infestation occurs.

Where significant numbers of fleahoppers are found, use insecticides that have the least effect on beneficial arthropods, because they are important for suppression of bollworms later in the season. Use lower rates and do not worry if you do no achieve 100 percent control of fleahoppers.

Tarnished Plant Bug

Tarnished plant bugs may present another problem for Kansas cotton growers especially where cotton fields are located close to alfalfa fields. Watch for plant bugs to move into cotton fields following alfalfa cuttings, which occurs at about the same time as fleahoppers. Plant bugs cause similar damage but are bigger, with damage continuing later into the season. According to some references, one plant bug equals about three fleahoppers. Many insecticides listed for fleahoppers are labeled for tarnished plant bugs.

Bollworm

The bollworm (corn earworm or sorghum headworm) is a serious pest in the southern cotton growing areas although damage has been limited even when significant infestations have developed in corn and grain sorghum. However, growers should watch for developing infestations during fruiting and boll development. The adult is a medium-sized, cream-colored moth and is seen frequently throughout the day during periods of heavy infestations. Moths deposit eggs singly, usually on young terminal leaves but sometimes on leaves and squares within the canopy. Eggs are the size of a pinhead, white to cream colored and hatch in two or three days during warm weather. Young larvae are difficult to find until they are three or four days old. At this stage, they are about ¼ inch long and brownish with some scattered hairs. The full-grown larva is about 1½ inches long with a light-colored head capsule. The predominant body color may range from pink or green to various shades of tan or dark brown. A series of dark stripes run lengthwise on the body. Larvae begin feeding on leaf tissue and small squares, then move down the plant and damage the larger squares and bolls.

Bollworm management is based on scouting for eggs or small larvae. For non-Bt cotton, treatment is recommended when 10 eggs or five small worms per 100 plants are present during early bloom in late July and early August. Bt cotton should be scouted for bollworm as well. Treatment should be considered in Bt cotton if fruit and boll damaged is noticed and there are 10 or more small larvae (¼ to ⅜ inch) per 100 plants, or 6 small larvae in 100 flowers selected at random. Preventative treatments applied during the pre-bloom period are discouraged because they can destroy beneficials which help keep bollworms and other pests under control.

Chemical control is seldom effective after worms exceed ½ inch in length (five days old, third instar). Once cotton has blooms within four to five nodes of the top of the plant, the need for bollworm control is usually over.

Insecticides Labeled for Thrips Control on Cotton[3]

Chemical Name	Product(s)
Seed Treatments	
Imidacloprid	Attendant, Dyna-Shield Imidacloprid, Gaucho Grande, Imida E-AG 5F ST, Senator and other products
Imidacloprid + thiodicarb	Aeris
Thiamethoxam	Cruiser
Hopperbox Treatments	
Acephate	Bracket and Orthene
Planting Time Treatments	
Acephate	Acephate, Bracket, and Orthene
Aldicarb	Temik and Bolster
Alpha-cypermethrin	Fastac CS (1.3 to 1.9 fl. oz./acre or 0.008 to 0.012 lb. a.i./acre)
Imidacloprid	Admire, Advise, Alias 2F and 4F, and Couraze 2F
Phorate	Phorate and Thimet
Foliar Treatments	
Acephate	Acephate, Bracket and Orthene
Acetamiprid	Intruder
Beta-cyfluthrin*	Baythroid XL
Bifenthrin*	Numerous products including Annex, Bifenthrin, Brigade, Discipline, Empower 2, Fanfare, Sniper, and Tundra
Bifenthrin + abamectin	Athena
Bifenthrin + chlorantraniliprole	Elevest (for foliar treatments)
Bifenthrin + imidacloprid	Brigadier and Tempest (adults)
Bifenthrin + zeta-cypermethrin	Hero
Chlorpyrifos	Multiple products
Chlorpyrifos +lambda-cyhalothrin	Cobalt Advanced
Chlorpyrifos+zeta-cypermethrin	Stallion
Cyfluthrin	Tombstone
Cyfluthrin + imidacloprid	Leverage
Cypermethrin*	Ammo
Deltamethrin*	Delta Gold
Dicrotophos	Bidrin
Dimethoate	Dimate and Dimethoate
Endosulfan	Endosulfan and Phaser
Esenfenvalerate*	Asana XL
Gamma-cyhalothrin*	Proaxis
Imidacloprid	Alias 4F, Couraze 1.6F, Imida E-AG 4F, Nuprid, Pasada, Provado, and Widow
Kaolin	Surround
Lambda-cyhalothrin*	Numerous products including Warrior II with Zeon Technology, Silencer, Taiga Z, and Lambda T
Lambda-cyhalothrin + chlorantraniliprole	Besiege
Malathion	Fyfanon, Malathion and Prentox
Methamidophos	Monitor
Methomyl	Lannate LV and Lannate SP
Oxydemeton	MSR and Metasystox-R
Potassium salts of fatty acids	M-Pede
Spinosad	Blackhawk
Thiamethoxam	Centric
Zeta-cypermethrin*	Mustang MAXX, etc.

*Pyrethroids do not work systemically and may not be the best option for controlling thrips. New plant tissue will not be protected.

Insecticides Labeled for Fleahopper Control on Cotton[3]

Chemical Name	Product(s)
Acephate	Acephate, Bracket and Orthene
Acetamiprid	Intruder and Assail
Alpha-cypermethrin	Fastac CS (2.6 to 3.6 fl. oz./acre)
Beta-cyfluthrin*	Baythroid XL
Bifenthrin*	Numerous products including Annex, Bifenthrin, Brigade, Discipline, Empower 2, Fanfare, Sniper, and Tundra
Bifenthrin + abamectin	Athena
Bifenthrin + chlorantraniliprole	Elevest
Bifenthrin + imidacloprid	Brigadier and Tempest
Bifenthrin + zeta-cypermethrin	Hero
Chlorpyrifos	Multiple products
Chlorpyrifos +lambda-cyhalothrin	Cobalt Advanced
Chlorpyrifos+zeta-cypermethrin	Stallion
Cyfluthrin + imidacloprid	Leverage
Cypermethrin*	Ammo
Deltamethrin*	Delta Gold
Dicrotophos	Bidrin
Dimethoate	Dimate and Dimethoate
Endosulfan	Endosulfan, Phaser and Thionex
Esenfenvalerate*	Asana XL
Flonicamid	Carbine
Gamma-cyhalothrin*	Proaxis
Imidacloprid	Alias 4F, Couraze 1.6F, Imida E-AG 4F, Nuprid, Pasada, Provado, Sherpa, and Widow
Indoxacarb	Steward
Kaolin	Surround
Lambda-cyhalothrin*	Numerous products including Warrior II with Zeon Technology, Silencer, Taiga Z, and Lambda T
Lambda-cyhalothrin + chlorantraniliprole	Besiege
Lambda-cyhalothrin + thiamethoxam	Endigo ZC
Methamidophos	Monitor
Methomyl	Lannate LV and Lannate SP
Novaluron	Diamond
Oxydemeton	MSR and Metasystox-R
Oxamyl	Vydate
Phosmet	Imidan
Potassium salts of fatty acids	M-Pede
Thiamethoxam	Centric
Thiodicarb	Larvin
Zeta-cypermethrin*	Mustang MAXX, etc.

*Pyrethroid insecticides should be used judiciously, especially if there is a chance that they will be needed to control bollworms later in the season.

The value of late-season treatments depends on the weather. In some cases late blooms can add to final yields, thus treatments may be justified if populations are heavy and weather remains favorable.

The use of Bt cotton in Kansas has increased, and it's important to note that bollworms must ingest the Bt gene (Bollgard®, Bollgard II®, Widestrike™ and VipCot®) to be killed. It may take up to five days from time of ingestion to death. Infected larvae lose their appetite and stop feeding within hours of ingesting the toxin. Survival increases as larvae mature and exceed ½-inch long or five days old.

Management strategies differ from bollworm-susceptible varieties. Different scouting techniques and economic thresholds must be employed in Bt cotton. Shorten scouting intervals to two to three days during ovipositional periods to determine if newly hatched larvae are controlled by the Bt gene (some resistance has been observed). Consider spraying if fruit and boll damage are excessive as indicated by 10 small worms (¼- to ⅜-inch long) per 100 plants or six small worms in 100 flowers selected at random.

Insecticides Labeled for Bollworm Control on Cotton[3]

Chemical Name	Product(s)
Acephate	Acephate, Bracket, and Orthene
Acetamiprid	Intruder and Assail (used as an ovicide)
Alpha-cypermethrin	Fastac CS (2.6 to 3.6 fl. oz./acre)
Bacillus thuringiensis	Biobit, Deliver, Dipel, Lepinox, and Xentari[1]
Beta-cyfluthrin	Baythroid XL
Bifenthrin	Numerous products including Annex, Bifenthrin, Brigade, Discipline, Empower 2, Fanfare, Sniper, and Tundra
Bifenthrin + abamectin	Athena
Bifenthrin + chlorantraniliprole	Elevest
Bifenthrin + imidacloprid	Brigadier and Tempest
Bifenthrin + zeta-cypermethrin	Hero
Chlorantraniliprole	Vantacor
Chlorpyrifos	Multiple products
Chlorpyrifos +lambda-cyhalothrin	Cobalt Advanced
Chlorpyrifos+zeta-cypermethrin	Stallion
Cyfluthrin	Tombstone
Cyfluthrin + imidacloprid	Leverage
Cypermethrin	Ammo
Deltamethrin	Delta Gold
Endosulfan	Endosulfan, Phaser and Thionex
Esenfenvalerate	Asana XL
Fenpropathrin	Danitol
Gamma-cyhalothrin	Proaxis
Imidacloprid	Alias 4F, Couraze Max 4F, Trimax, and Wrangler
Indoxacarb	Steward
Lambda-cyhalothrin	Numerous products including Warrior II with Zeon Technology, Silencer, Taiga Z, and Lambda T
Lambda-cyhalothrin + chlorantraniliprole	Besiege
Lambda-cyhalothrin + thiamethoxam	Endigo ZC
Methomyl	Lannate LV and Lannate SP
Methoxyfenozide	Intrepid
Naled	Dibrom
Novaluron	Diamond
Profenofos	Curacron[2]
Spinosad	Entrust, Blackhawk
Thiodicarb	Larvin
Zeta-cypermethrin	Mustang MAXX. etc.

[1] Products containing Bt should not be used on Bt cotton or its refuge.
[2] Curacron and Lannate may be phytotoxic to cotton under stress and may redden cotton.
[3] For use rate and any other information relative to any insecticide listed in these tables please ALWAYS consult the actual label on the product.

Worker Protection Standard

The Worker Protection Standard (WPS) is a series of federal regulations pertaining to pesticides used in agricultural plant production on farms, forests, nurseries, and greenhouses. You must comply with these regulations if you are an agricultural pesticide user and/or an employer of agricultural workers or pesticide handlers. For details, consult the U.S. Environmental Protection Agency publication, The Worker Protection Standard for Agricultural Pesticides—How to Comply, What Employers Need to Know. This publication is available at your local K-State Research and Extension office.

Endangered Species

EPA's Endangered Species Protection Program (ESPP) helps promote the recovery of endangered species. If limitations on pesticide use are necessary to protect listed species in a certain geographic area, the information is relayed through Endangered Species Protection bulletins. Pesticide labels may direct you to contact your local extension office. This information is also available from the EPA: *epa.gov/espp/bulletins.htm*

Resources

Cotton Insect Control Recommendations. OSU Extension Agents' Handbook of Insect, Plant Disease and Weed Control, E-832.

Cotton Insects. BugwoodWiki. *wiki.bugwood.org/Cotton*

Cotton Insects and Diseases. Texas A&M, Lubbock. *lubbock.tamu.edu/programs/crops/cotton/general-production/*

Cotton Insect Sampling Videos. *lubbock.tamu.edu/videos/*

Cotton Worms. Bynum, Byrns, Fuchs, Minzenmayer and Multer, Texas A&M. *lubbock.tamu.edu/files/2011/11/Cotton-WormsID.pdf*

Crop Insects of Kansas. 2022. H.N. Davis, Whitworth, R.J., and Sloderbeck P.E. Kansas State University., S152.

Field Key to Larvae in Cotton. pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-2344/EPP-7161web2013.pdf

Field Guide to Predators, Parasites and Pathogens Attacking Insect and Mite Pests of Cotton. A. Knutson and J. Ruberson. *cotton.tamu.edu/Videos/pdf/E-357.pdf*

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