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Field Guide to

Pests & Beneficials

in Texas Grain Sorghum

Texas Agricultural Extension Service
THE TEXAS A&M UNIVERSITY SYSTEM

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Beneficial Organisms

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Introduction

There are 2.7 to 4.4 million acres of sorghum planted in Texas each year. Sorghum producers should be able to identify the insect and mite pests that damage sorghum, as well as the natural enemies of these pests. The photographs and information in this guide will help. Some minor or occasional pests and non-pest arthropods are excluded because they are not important to sorghum production in Texas. Any arthropods not in this guide that appear in large numbers in fields showing damage should be reported to your county Extension agent. It may be a new pest of Texas grain sorghum.

Wireworms

Various species of *Elateridae* and *Tenebrionidae*

Description and Damage: True and false wireworms are immature stages of click and darkling beetles and are found in the soil. Larvae are the damaging stage. Larva are shiny, slender, cylindrical and hard-bodied. They range in color from yellow to brown. Fully grown larvae are about 1 inch long, but different species vary in length. Wireworms damage sorghum by destroying planted seed or, to a lesser degree, by feeding on seedling roots. Plant stands and vigor are reduced.

Biology: The biology depends on the species. Information here is general and applies to the entire group. Wireworms attacking sorghum deposit eggs in clusters in the soil. The eggs are minute, oval and pearly white. Young larvae are creamy white, but change to a shiny yellow as they grow older. Larvae transform to fragile white pupae. Adult beetles are brown to nearly black and 1/4 to 1/2 inch long. A generation requires a year or more to complete.

Wireworm (A. Sparks)

White Grubs

Phyllophaga crinita (Burmeister) and others

Description and Damage: White grubs are the larval stages of several species of May or June beetles. Larvae are "C-"shaped with white bodies, tan or brown heads, and three pairs of small legs. Larvae vary in size according to age and species. Fully grown larvae are 1 to 1 1/2 inches long. The last abdominal segment is transparent, with dark digested material visible inside. Larvae damage sorghum by feeding on the roots. Small seedlings may be killed, resulting in stand loss. Severely pruned roots of larger plants cause stunted plants, plant lodging and increased susceptibility to drought and stalk rot organisms. Plant stand losses often appear in irregular (clumped) patterns in a field.

Biology: Adults, commonly called May beetles or June beetles, are brownish black and 1/2 to 3/4 inch long. Female beetles lay eggs in cells in the soil near plant roots. Depending on the species, the life cycle may require a year or more to complete. In Texas, larvae overwinter in cells in the soil.

White grubs dug from soil
(A. Sparks)

Southern Corn Rootworm

Diabrotica undecimpunctata howardi (Barber)

Description and Damage: Rootworms are the larval stage of cucumber beetles and related species. Rootworms are small, brown-headed, creamy white to yellowish larvae that burrow into the germinating seeds, roots and crowns of sorghum plants. Adult rootworms (beetles) are 1/4 to 3/8 inch long, light green to yellow, and have spots on their wing covers. Rootworms reduce stands and plant vigor. Another symptom is "dead heart" in young plants. On seedling plants the damage is a small hole in the crown of the plant just below the soil surface. On older plants, root pruning is the primary damage.

Biology: Southern corn rootworms (spotted cucumber beetles) lay eggs after sorghum is in the seedling stage. Young larvae tunnel into the roots of newly sprouted sorghum plants. This pest may have more than one generation per year.

Rootworm larvae (G. Cronholm)

Southern corn rootworm adult (A.Sparks)

Lesser Cornstalk Borer

Elasmopalphus lignosellus (Fabricius)

Description and Damage: Larvae of the lesser cornstalk borer attack the root systems and lower stalks of sorghum by burrowing into the stalks just below the soil surface. Larvae are light bluish green with prominent transverse brown bands that may appear purplish. They are slender and about 3/4 inch long. Larvae feed from silken tunnels attached to the plant. The moth is brownish gray with a wing expanse of less than 1 inch.

Biology: Eggs are laid on the soil near the plant or on the host plant, and hatch in about 7 days. The larva becomes fully grown in 2 to 3 weeks. Larvae have a distinctive habit of jerking and skipping when disturbed. Larvae pupate in silken cocoons under crop debris. The pupal stage lasts 2 to 3 weeks. Larvae or pupae pass the winter in stalk burrows in the soil.

Lesser cornstalk borer with exit hole
(E. Thomas)

Lesser cornstalk borer silken tunnel
(E. Thomas)

Sugarcane Rootstock Weevil

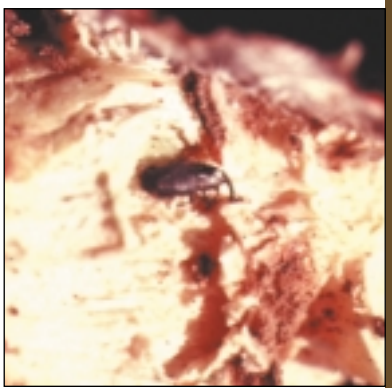
Anacentrinus deplanatus (Casy)

Description and Damage: Adult weevils are dark brown or black, about 1/8 inch long and 1/16 inch wide. They feed on young sorghum plants and crowns, but rarely cause significant damage. Larvae are the damaging stage. They are found inside the sorghum stalk near the base. Larvae are white, legless grubs with brownish black heads, about 1/5 inch long when fully grown. Their feeding damage often makes plants look drought-stressed and causes plants to lodge. Feeding and egg-laying also create sites where diseases such as charcoal rot can enter the plant.

Biology: Adult weevils overwinter in plant residue. In early spring they emerge to infest wild grasses, such as johnsongrass, and then move to sorghum. The female weevil chews a small hole in the sorghum stalk near the base and lays an egg within the hole. Females lay an average of 16 eggs, which hatch in 4 to 10 days. Larvae feed within the stalk for 25 days. Feeding tunnels resemble those made by other borers, except that they are much smaller and do not extend up the stalk. Larvae are often found at nodes near the outer surface of the stalk. The pupal stage lasts 10 to 12 days; then the adult weevil emerges from the stalk. A generation is completed in about 40 days and there may be several generations per growing season.

Sugarcane rootstock weevil grub inside sorghum root base (G.Cronholm)

Sugarcane rootstock weevil (G. Cronholm)



Black Cutworm

Agrontis ipsilon (Hufnagel) and other species

Description and Damage: Cutworms are the larvae of several moth species. The typical cutworm is grayish black, plump, smooth, and 1 1/4 to 1 3/4 inches long. Cutworms are active at night and damage seedling sorghum by cutting off the stalk just above ground level. Some subterranean cutworms feed on the roots of seedling plants.

Biology: Most cutworms pass the winter as larvae, though some hibernate in the soil as pupae. In Texas, cutworms overwinter as small larvae in cells in the soil, under trash, or in clumps of grasses. They start feeding in the spring and continue growing until early summer, when they pupate in the soil. Grassy sod and weedy fields are attractive to moths for egg laying, so cutworms may be abundant in such areas. Eggs are laid on stems or leaves of sorghum or in the soil, and hatch in 2 to 14 days.

Cutworms near damaged sorghum plant
(L. Brooks)

Yellow Sugarcane Aphid

Sipha flava (Forbes)

Description and Damage: This lemon-yellow, 1/16- to 1/8-inch-long aphid is covered with hairs. It has two rows of dark tubercles down the back. Yellow sugarcane aphids inject a toxin that causes purple colored leaves or spots. On older plants, leaves become severely yellowed.

Biology: Without mating, females give birth to living young. Nymphs mature in 13 to 19 days and live 25 to 50 days. Both winged and wingless forms can exist in the same colony. The yellow sugarcane aphid has a wide range of wild hosts and often is found on johnsongrass and dallisgrass in Central and South Texas. From one to as many as 50 or 60 adults and nymphs may be found on sorghum seedlings.

Yellow sugarcane aphid colony (A. Sparks)

Damage by yellow sugarcane aphid (E. Thomas)

Greenbug

Taxoptera graminum (Rondani)

Description and Damage: The adult aphid is about 1/8 inch long. It is light green with a darker green stripe down its back. The tips of the legs and cornicle are black. Winged and wingless forms may be present in the same colony. Greenbugs usually feed in colonies on the undersides of leaves. They suck plant juices and inject a toxin. Red spots on upper leaf surfaces and the presence of honeydew are common symptoms. Heavy damage may result in dead leaves and, eventually, dead plants.

Biology: Females produce living young (nymphs) without mating. Under optimum conditions the life cycle is completed in 7 days, and each female produces about 80 offspring during a 25-day period.

Greenbugs on sorghum (A. Sparks)

Greenbug damaged sorghum leaves (red color) (P. Sloderbeck)

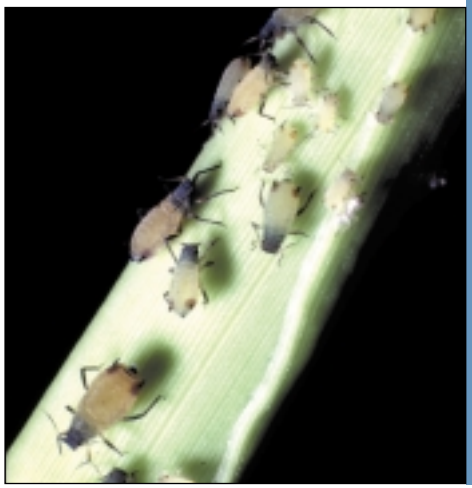
Corn Leaf Aphid

Rhopalosiphum maidis (Fitch)

Description and Damage: The aphid is dark bluish green and somewhat oval. It is 1/16 inch long with black legs, cornicles and antennae. Winged and wingless forms occur.

Biology: Females give birth to living young without mating and a generation can be completed in about a week. In Texas the insect is active throughout the winter. These aphids generally infest the whorl of sorghum plants. Their densities often decline as plants enter the boot and heading stage. Panicles may become heavily infested with cornleaf aphids while the grain is immature.

Corn leaf aphids
(A. Sparks)



Corn leaf aphids from sorghum whorl

Chinch Bug

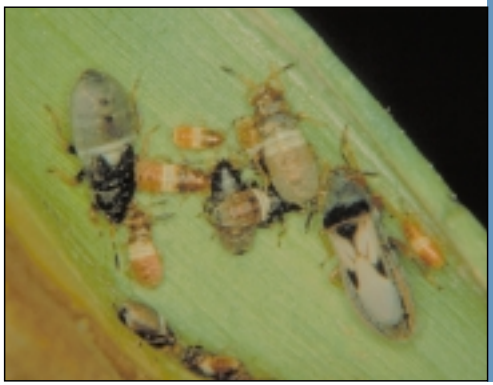
Blissus leucopterus (Say)

Description and Damage: Chinch bugs are sporadic pests of sorghum in Texas. The 3/16-inch-long adult chinch bug is black with conspicuous white forewings, each of which has a black triangular spot at the middle of the outer margin. The legs are reddish yellow. Immature chinch bugs resemble adults in shape but lack wings. Newly hatched nymphs are pale yellow, but soon become red except for the first two abdominal segments. There is a white band across the back.

Later instars become darker red but retain a pale yellow band across the forward part of the abdomen. The last instar is black and gray with a conspicuous white spot on the back between the wing pads. Damage may first appear as purplish leaves on seedling plants. This symptom can be confused with yellow sugarcane aphid damage or other crop stresses. Chinch bug damage can become severe enough to stunt plants and reduce stands.

Biology: Eggs are laid behind the lower leaf sheaths of host plants, on roots, or in the ground nearby. The life cycle is completed in 30 to 40 days and there are normally two generations a year. Chinch bugs overwinter as adults in bunch grass and other grasses.

Chinch bug adults and nymphs (B. Wright)



Banks Grass Mite

Oligonychus pratensis (Banks)

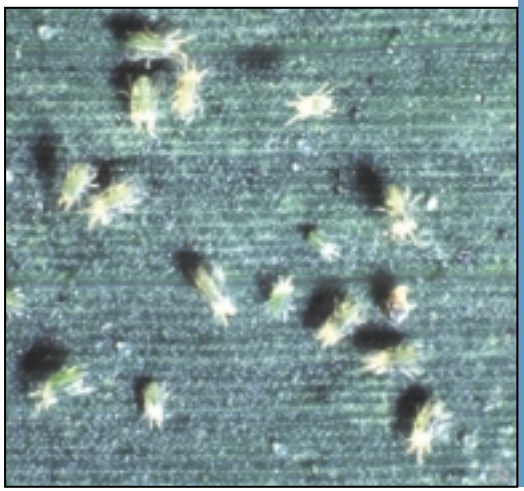
Two-spotted Spider Mite

Tetranychus urticae (Koch)

Description and Damage: Banks grass mites and two-spotted spider mites have eight legs and are less than 1/32 inch long. Newly hatched Banks grass mites are light, becoming darker green as they mature. Two-spotted spider mites are also light with two large, dark spots on each side of the body. Mites have mouthparts that puncture the leaf tissue and suck plant juices. Heavy infestations give leaves a dull green appearance; leaves may later wither and die. When damage is extensive, plants may lodge. Historically, Banks grass mites have caused more damage to sorghum than two-spotted spider mites, especially in the arid regions of Texas.

Biology: Eggs are laid on the undersides of leaves in the webbing produced by female mites. Eggs are pearly white, spherical, and about one-fourth the size of the adult. They hatch in 3 to 4 days. Banks grass mites require 11 days at 80 degrees F to complete a life cycle. The life cycle of two-spotted spider mites is about 5 days at 75 degrees F. Although mites can be observed early in the growing season, the most rapid population increases occur after sorghum reaches the reproductive stage.

Banks grass mites
(A. Sparks)



Sorghum Midge

Stenodiplosis sorghicola (Coquillett)

Description and Damage: The sorghum midge is one of the most damaging insects to sorghum in Texas. The adult is a tiny, fragile looking, reddish orange fly about 1/16 inch long. Larvae are colorless at first, but dark orange when fully grown. Larvae developing inside sorghum flowers prevent seed formation, often resulting low grain yields.

Biology: Female sorghum midge are most abundant from about 10 a.m. to 2 p.m. each day when sorghum is 25 to 75 percent in flower. Each female lays about 50 eggs inside flowering spikelets during her 1-day life. Eggs hatch in 2 to 3 days and larvae develop between the spikelet glumes, feeding on the developing kernel. Larval development takes 9 to 11 days. They then pupate between the glumes of kernels. The pupal period is completed in 3 days. Shortly before the adult emerges the pupa works its way toward the apex of the spikelet until about three-fourths of its length protrudes. When the adult emerges the white pupal skin remains at the tip of the spikelet. Larvae diapause in a cocoon within a spikelet. Johnsongrass is an important alternate host for midge before the new crop of sorghum.

Sorghum midge pupal cases
(J.W. Stewart)

Sorghum midge adult
(A. Sparks)

Sorghum Webworm

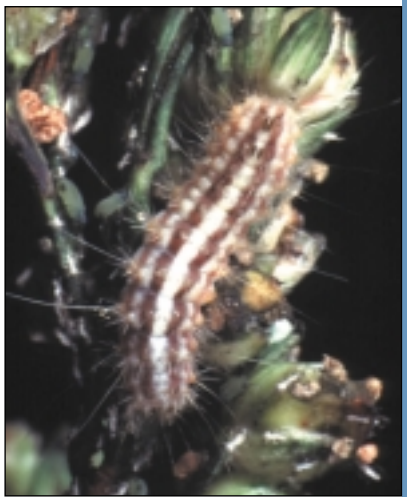
Celama sorghiella (Riley)

Description and Damage: The adult is a small, white moth with a wingspan of about 1/2 inch. Webworm larvae are reddish to yellowish brown, somewhat flattened, and marked with four longitudinal reddish to black stripes. Larvae are approximately 1/2 inch long when mature and densely covered with hair. The larvae feed primarily on sorghum kernels.

Biology: Moths are active at night and live about 5 days. Females lay about 100 eggs singly, securely fastening them to the flowering parts or kernels of sorghum. Eggs are less than 1/32 inch in diameter. They are white at first but turn deep yellow to brown before hatching in 3 to 4 days. A generation requires about a month. Larvae diapause on the host plant. The sorghum webworm occurs primarily in the more humid areas of eastern and southern Texas.

Sorghum webworm moth (E. Thomas)

Sorghum webworm (A.Sparks)



Fall Armyworm

Pseudaletia unipuncta (Haworth)

Description and Damage: The moth has variegated gray forewings. Eggs are usually deposited on the underside of leaves in large masses covered with scales of the moth. Young larvae are slightly greenish and have black heads. Mature larvae vary from greenish to a grayish brown, have a light-colored inverted Y-shaped suture on the brownish head, and dorsal lines running lengthwise on the body. Larvae often feed in the plant whorl before the sorghum heads. As leaves emerge from the whorl they show ragged "shot hole" damage. Larvae may also attack developing sorghum heads until the hard dough stage. The result is missing or gnawed kernels.

Biology: The insect requires about a month to complete a generation.

Fall armyworm larva (A. Sparks)

Corn Earworm

Helicoverpa zea (Bodie)

Description and Damage: Moths are about 3/4 inch long with a wingspan of 1 1/2 inches. They vary from dusty yellow, olive green, or gray to reddish brown. Eggs are flattened spheres laid individually; they are prominently ribbed, 1/16 inch in diameter, white when first laid but soon turning dark. Newly hatched larvae are white and grow rapidly. As they grow their color changes to pink, green, yellow or almost black. Many are conspicuously striped and have dark spots on each body segment. Down the side there is a pale stripe edged above with a dark line. Down the middle of the back there is a dark stripe divided by a narrow white line that makes the dark line appear double. Fully grown larvae are 1 to 1 1/2 inches long. The pupa is about 3/4 inch long and changes from green to brown. Like fall armyworms, corn earworms often feed in the plant whorl before sorghum heads. As leaves emerge they show similar "shot hole" damage. Larvae also may attack developing sorghum heads until the hard dough stage. Damage evidence includes missing or gnawed kernels.

Biology: Females are active in the evening and live about 12 days. Eggs hatch in 3 to 5 days. Pupation occurs in the soil, and the pupa is the overwintering stage. A generation usually requires about a month to complete. Corn earworms are cannibalistic, which usually reduces the number of larvae found per head.

Corn earworm on sorghum panicle (A.Sparks)

Corn earworm moth (A. Sparks)

Differential Grasshopper

Melanoplus differentialis (Thomas) and others

Description and Damage: Grasshoppers range in color from yellow to light grey-brown with dark markings. Sizes range from less than 1 inch to almost 2 inches. All grasshoppers have large hind legs for jumping. Usually only older nymphs and adults are found in grain sorghum fields. All plant stages may be attacked. Grasshopper feeding on maturing grain heads reduces yield. Infestations generally are concentrated on field margins.

Grasshopper on sorghum head (A. Sparks)

Differential grasshopper (G. Cronholm)

Southern Green Stink Bug

Nezara viridula (Linné)

Description and Damage: The southern green stink bug is green, shield-shaped, and 3/4 inch long. Nymphs are reddish black to black with white spots on the top of the body. As forth and fifth instars, their color changes from black to pale green with pink and black markings. There are white spots on the margins and on each side of the midline on top of the body.

Stink bugs feed mainly on kernels and cause the most damage during early kernel development.

Biology: In the spring, overwintered females deposit eggs in clusters of about 30. Eggs hatch in about 7 days and nymphs reach adulthood in about 6 weeks. Nymphs stay close to the egg mass until they reach about the third instar (growth stage); then they move away. Nymphs stay clustered as they feed on the sorghum plant. Repeat generations occur at 5- to 6-week intervals. Adults live 40 to 60 days or all winter.

Southern green stink bug (N. Troxclair)

Green Stink Bug

Acrosternum hilare (Say)

Description and Damage: Adult green stink bugs are bright green with reddish bands on their antennal segments, and are 3/4 inch long. Color of the first two instars is reddish brown. Second and third instars are dull green with black and white stripes on the top of the body. The last two instars are either green with yellow and black vertical stripes on the abdomen or pale yellow-green with a black pronotum and wing pads, and a black area in the center of the top of the body. Green stink bug nymphs also remain close at first to the egg cases from which they hatch. When they move away from the egg cluster they stay close together when feeding.

Stink bugs feed mainly on kernels and cause the most damage during early kernel development.

Green stink bug (C. R. Carner)

Conchuela Bug

Chlorochroa ligata (Say)

Description and Damage: The conchuela varies from olive or ash gray to green, purplish pink, or reddish brown. The most characteristic markings are an orange-red band along the lateral margins of the thorax and margins of the wings, and a spot of the same color on the back at the base of the wings. Adults are approximately 3/4 inch long.

Stink bugs feed mainly on kernels and cause the most damage during early kernel development.

Conchuela bug (C. R. Carner)

Brown Stink Bug

Euschistus servus (Say)

Description and Damage: Brown stink bug nymphs are pale yellow-green to tan with dark brown spots in the center of the back. Adults are 3/4 inch long and brown with a yellow or light green underside.

The brown stink bug has a rounded lateral angle on the shoulders. The similar spined soldier bug (*Podisus maculiventris*) has pointed shoulders and is a predator, not a pest of sorghum.

Stink bugs feed mainly on kernels and cause the most damage during early kernel development.

Brown stink bug

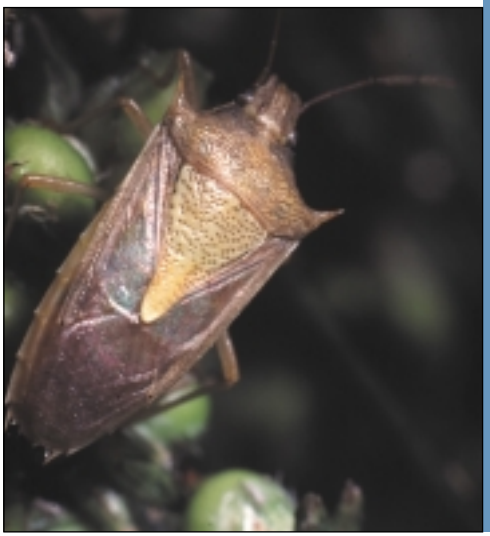
Rice Stink Bug

Oebalus pugnax (Fabricius)

Description and Damage: Adults are straw-colored, shield-shaped, and 1/2 inch long. The adult has forward projecting points on each shoulder. Females deposit 10 to 50 light green, short, cylindrical eggs in a two-row cluster. Eggs hatch after about 5 days. Nymphs require 15 to 28 days to become adults.

Stink bugs feed mainly on kernels and cause the most damage during early kernel development.

Rice stink bug (A. Sparks)



False Chinch Bug

Nysius raphanus (Howard)

Description and Damage: The false chinch bug superficially resembles the chinch bug, but its color is more uniform and ranges from grayish to brown. It is about 1/8 inch long. The insect occasionally migrates in large numbers from nearby wild hosts to sorghum fields, but infestations usually are concentrated in small areas, particularly along field margins. This bug has a sucking, stylet-type mouthpart and feeds chiefly on sorghum heads. Reduced kernel weight and quality result from false chinch bug feeding.

False chinch bugs (J. W. Stewart)

Leaf-footed Bug

Leptoglossus phyllopus (Linnaeus)

Description and Damage: This bug is brown, oblong, and 3/4 to 1 inch long. A white band extends across the back. The tibiae of the hind legs are flattened or leaf-like. Eggs are laid in clusters of 15 to 35 in rows. Nymphs are reddish. Infestations may be clumped in small areas or evenly distributed across a field.

Leaf-footed bugs cause the most damage during the milk to soft dough stage of kernel development.

Leaf-footed bug (A. Sparks)

Southwestern Corn Borer

Diatraea grandiosella (Dyar)

European Corn Borer

Ostrinia nubilalis (HÅbner)

Sugarcane Borer

Diatraea saccharalis (Fabricius)

Mexican Rice Borer

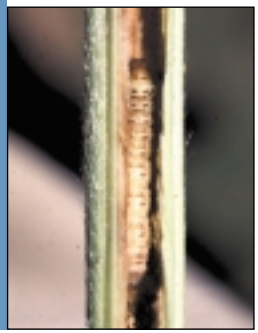
Eoreuma loftini (Dyar)

Description and Damage: Young larvae of sugarcane and southwestern corn borers are creamy white and marked with brown to black spots. More mature overwintering larvae have no spots or less distinct ones. The larva of the Mexican rice borer has broken dashed lines instead of spots.
These closely related pests of sorghum, corn and other crops tunnel into and damage plant stalks. Borer-infested stalks are smaller and often lodge. Borer damage also causes “dead heart” (dead whorl of the plant) and increases susceptibility to stalk-rotting diseases. Damage to sorghum can range from a few plants to large areas of a field where nearly all plants have fallen over.

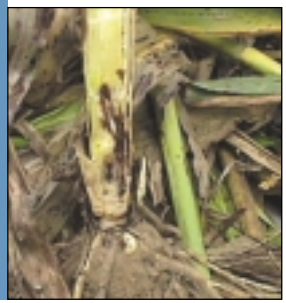
Biology: Larvae overwinter in the stalks or root crowns of sorghum plants and in other crop debris. Pupation occurs in these sites. Buff-colored adult moths emerge and lay eggs in shingle-like arrangements on leaves and stalks of host plants. Larvae generally feed in leaf sheaths before boring into the stalk.

Southwestern corn borer larva (G. Cronholm)

Sugarcane borer larva (E. Thomas)

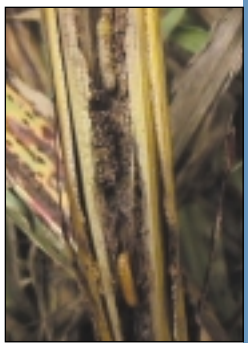


Mexican rice borer and damage to sorghum stalk crown (J. Norman)



European corn borer larva (F. Peairs)

Mexican rice borer larva (top) **and pupa** (bottom) **in sorghum stalk** (J. Norman)



Beneficial Organisms

Many insects, mites and spiders are natural enemies of grain sorghum pests. Some of the more obvious species of beneficial insects in sorghum include lady beetles, parasitic wasps, lacewings, spiders, and several members of the true bug family such as pirate bugs and assassin bugs. These beneficial organisms occur at varying levels and at different times within the season, depending on the abundance of pests in the field. Lady beetles generally feed on aphids. Various species of parasitic wasps attack aphids or pest larvae such as headworms or stalk borers. Spiders feed on almost any insects in their paths. Predaceous true bugs feed on all the above.

Disease organisms also can help control some pests, particularly aphids and some caterpillars. Disease organisms are not included in this guide.

Red Cross Beetle

Collops balteatus (Le Conte)

Description: The adult is a 1/4-inch-long beetle with a red marking that resembles a red cross on the wing covers. The middle body segment is also red with dark blue markings.

Prey: This insect is usually found near blooming sorghum heads where it can more easily find food. It feeds on sorghum pollen and aphids, as well as other small insects and their eggs.

Red Cross beetle (A. Sparks)

Green Lacewings

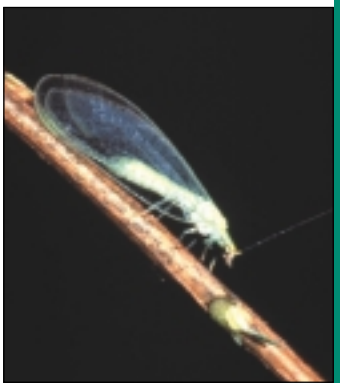
Chrysoperla species

Description: Several species of lacewings are predators of sorghum insect and mite pests. Adults are greenish or yellowish with delicate, lace-like wings and shining golden eyes in some species. They are soft-bodied insects about 3/4 inch long. The alligator-shaped larvae have elongated, sickle-shaped mandibles to puncture and extract body fluids from their victims. These mandibles readily distinguish them from lady beetle larvae.

Biology: Lacewings usually hibernate as pre-pupae in silken cocoons. Some may overwinter as adults. Adults emerge in the spring and lay eggs on silken stalks that project about 1/2 inch above the surface of the leaf or stem to which they are attached. It is thought that the stalks protect the eggs from their natural enemies, particularly larvae of their own kind. Eggs hatch in about a week. Both the larval and pupal periods last 2 to 3 weeks. Larvae seek sheltered places on leaves or elsewhere and spin cocoons in which they pupate. Lacewing pupae often are mistaken for spider egg cases. A generation requires about 40 days and there may be five or six generations annually in warm climates.

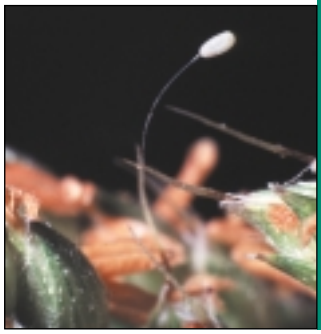
Prey: Lacewing larvae, called aphid lions, are among the more important beneficial insects. Larvae feed voraciously on aphids, thrips, mites, small larvae, and other soft-bodied insects or eggs.

Lacewing adult



Lacewing larva (A. Sparks)

Lacewing egg



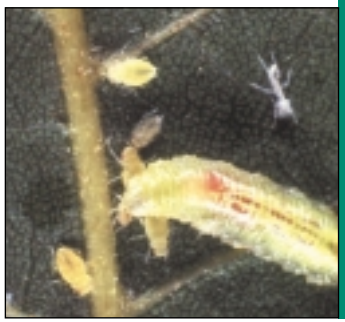
Syrphid flies

Syrpus species

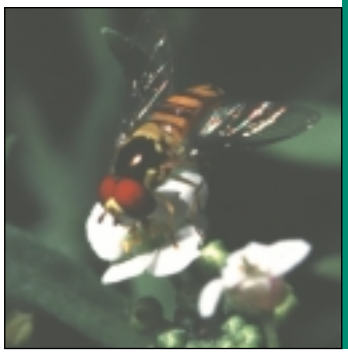
Description: Adults of this very large group also are called flower flies, hover flies and sweat flies. Many are brightly colored and resemble bees or wasps. They feed on nectar and pollen and pollinate many plants. Many hover motionless in the air except for the beating of their wings; others fly with a buzzing sound like that of bees. Adults lay glistening, white, elongated eggs among groups of aphids. Syrphid fly larvae, as a group, vary considerably in habits and appearance. Length varies from 1/4 to 1/2 inch when fully grown. Larvae are varying shades of yellow, pink, green or brown marked with black or white. Their bodies are pointed at the head end, broad at the tail end, and somewhat depressed. They are elongated, legless and slug-like.

Prey: Larvae commonly are found among aphid colonies. They move slowly over the surface of the plant, grab aphid after aphid with their pointed jaws, raise them into the air, and slowly suck out the body contents. Then they discard the empty skin. Larvae often destroy aphids at the rate of one per minute over a considerable period of time.

Syrphid fly pupa



Syrphid fly adult (J. Jackman)



Syrphid fly larva

Minute Pirate Bug

Orius species

Description: Adult minute pirate bugs or flower bugs are small (usually about 1/8 inch long) and black with white markings. The elongated, thickened, basal portion of the front wings is yellowish white and marked by a large, triangular black spot at the tip; the membranous part of the wing is white. The insect bears a superficial resemblance to the chinch bug, but is smaller. The tiny nymphs are yellowish to light orange. Adults overwinter in trash. Eggs are deposited in plant tissues. Several generations are completed each season.

Prey: Minute pirate bugs feed on insect eggs, newly hatched larvae, nymphs, spider mites, thrips and other small insects.

Minute pirate bug (D. Mock)

Minute pirate bug nymph
(W. P. Morrison)

Big-eyed Bug

Geocoris species

Description: These insect predators range in size from 1/8 to 3/16 inch long, depending on the species. They are oval with large, protruding eyes. Their bodies are dark with nearly clear wings. The color of the immature stage varies with the species.

Biology: Female big-eyed bugs lay hot dog-shaped, whitish eggs on plant parts. The singly laid eggs hatch in 5 to 8 days, depending on temperature. The complete life cycle ranges from 3 to 4 weeks, which is also the life span of adults.

Prey: Both adults and nymphs prey on small insects.

Big-eyed bug adult (A. Sparks)

Big-eyed bug nymph
(G. Cronholm)

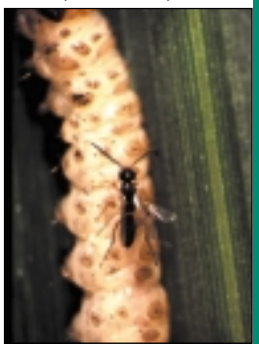
Parasitic Wasps

Various species of wasps parasitize aphids, larvae and other insects found in sorghum fields. Parasitized aphids appear as swollen, hardened, tanned "mummies." Immature forms of parasitic wasps may develop in or on the host. Most common species are internal parasites. Parasitic wasps range in size from nearly microscopic to more than 1 inch long. Most species found in sorghum fields are nearly black, but a few are dark to light red.

Parasitic wasp (undetermined species) near yellow sugarcane aphids (A. Sparks)

Parasitic wasp depositing egg in aphid

***Cotesia flavipes* parasitic wasp on sugarcane borer** (R. Saldaña)



Greenbug aphid mummies, parasitized by wasp (J. Campbell)

Spiders

Spiders generally are very useful in reducing pests in sorghum fields. Occasionally, spiders capture other predators such as lady beetles. Several different families of spiders may be found in sorghum fields during the grain production season. Crab spiders (*Misumenops* spp.) are most common. They have a flattened look and hold their legs out to their sides, usually with the longer front two pairs projecting forward. Crab spiders can walk sideways, which gives them their common name.

Prey: Crab spiders sit and wait for their prey to come along. Then they grab the prey, overpower it, and inject venom to immobilize it. Crab spiders often capture prey larger than they are.

Crab spider (A. Sparks)

Lady Beetles

Description and Biology: The most common lady beetles found in Texas sorghum are the convergent lady beetle, ash-gray/southern two-spotted lady beetle, and various species of Scymnus lady beetles. Lady beetles lay clumps of yellowish, football-shaped eggs on plant material or refuse on the ground. Both adults and larvae are predaceous. Larvae are about 3/8 inch long, alligator-shaped, and vary in color depending on species. Common colors are dark bluish with red or yellow markings. Lady beetle larvae lack the large, sickle-shaped mandibles that distinguish lacewing larvae. Scymnus larvae are different from other species and are discussed on page 74. Lady beetles pupate in the field, with the pupae strongly attached to plants.

Lady beetle pupal case (G. Cronholm)

Lady beetle larva (A. Sparks)

Lady beetle eggs (J. Campbell)

Convergent Lady Beetle

Hippodamia convergens (Guerin-Meneville)

Description: The convergent lady beetle is named for the two white lines on the pronotum (shield-like area behind the head) that, if extended, would converge. The margin of the pronotum also is lined with white. The number of black dots on the adults ranges from a few to 13. Adults may congregate in sheltered areas to overwinter.

Prey: Adults and larvae feed primarily on aphids and can become very abundant when aphids are present. Adults also feed on nectar and pollen.

Lady beetles, clockwise from top left: Cycloneda munda (no common name), **pink lady beetle, twice-stabbed lady beetle, Scymnus lady beetles, convergent lady beetle** (A. Knutson)

Ash-gray/Southern Two-spotted Lady Beetle

Olla v-nigrum

Description: Adults of this species occur in two distinct color forms. One form is black with two red spots and is called the southern two-spotted lady beetle. This form is almost identical to the twice-stabbed lady beetle, except that the southern two-spotted has a white margin around the pronotum. The second form is tan-gray with two rows of black spots and is called the ash-gray.

Prey: Adults and larvae feed primarily on aphids and other soft-bodied insects.

Southern two-spotted lady beetle
(A. Knutson)

Scymnus Lady Beetle

Scymnus (Pullus) *loewii* (Mulsant)

Description: Scymnus lady beetles are small, (1/16 to 1/8 inch) and dull orange to brown. Adults have a black center that forms a "V" pattern on the wing covers. Larvae are covered with long, white streamers of wax. These fuzzy, white larvae sometimes are confused with mealybugs.

Biology: Eggs are tiny, barrel-shaped, golden, and laid singly on sorghum leaves. Eggs hatch in 3 to 4 days and larvae develop in 14 to 17 days. Larvae pupate on the plant. Pupae resemble larvae in that they are covered with wax, but unlike larvae they do not move. The wax covering may provide some protection from fire ants. Adults emerge after 5 to 8 days and live 3 to 6 weeks. There can be two or three generations per year.

Prey: Adults and larvae feed primarily on aphids but may also feed on mites.

Scymnus lady beetle larvae
(A. Sparks)

Other Species of Lady Beetles

(no common name)

Cycloneda munda (Say)

Twice-stabbed Lady Beetle

Chilocorus stigma (Say)

Pink-spotted Lady Beetle

Coleomegilla maculata (DeGeer)

Seven-spotted Lady Beetle

Coccinella septempunctata (Linnaeus)

Descriptions: These four species of lady beetles also can be found in sorghum. Pink-spotted lady beetle is pink with six very large black spots on each forewing. Seven-spotted lady beetle has seven black spots on the wing cover. Twice-stabbed lady beetle is about 1/4 inch long and can be confused with the dark form of southern two-spotted lady beetle. C. munda is orange-red, has no spots, and is about 1/4 inch long. White markings are visible near the head.

Prey: The adults and larvae of these species feed primarily on aphids. The pink-spotted lady beetle also feeds on pollen and moth eggs, while the twice-stabbed lady beetle also feeds on scale insects.

For information on sampling and economic thresholds of, and management tactics for, sorghum pests in Texas, refer to B-1220, "Managing Insect and Mite Pests of Texas Sorghum," available from the Texas Agricultural Extension Service.

Additional references used in development of this handbook:

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