



An identification guide for **Sorghum Insect Pests** in South Dakota



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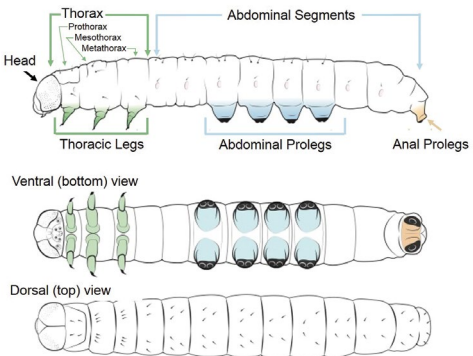
How to identify insects

Adult insects have three distinguishing features to look for; six legs, one to two pair of wings (if present), and three body segments (head, thorax and abdomen). These features are found on all insects even though they can sometimes be modified and appear different. Flies, for example, have two pairs of wings except the hindwings are modified into halteres, which look like small clubs. Beetles also have two pair of wings, except the forewings are modified into hard shells/ covers called elytra.



How to identify caterpillars

Caterpillars are the larval (immature) form of butterflies and moths. There are several characteristics used to identify caterpillar species, including color, pattern, number of abdominal prolegs, and the presence of elongated hairs and/or tubercles (spots). Of these characteristics, the number of abdominal prolegs is often the most important.



Aphids

(Hemiptera: Aphididae)

Greenbug

(*Schizaphis graminum*)

Nymph and Adult Identification

- Light green to yellow color
- Adults are approximately 1/6 to 1/8 inch long
- Nymphs will vary in size based on life stage
- Narrow dark green stripe down middle of back
- Legs are green with black tips
- Cornicles are green with black tips
- Antennae are darker in color than body



Aphids

(Hemiptera: Aphididae)

Greenbugs

(*Schizaphis graminum*)

Crop Damage

- Nymphs and adults feed on plant sap
- Can cause wilting and decreased yield

Scouting Tips

- Walk in a W or Z pattern and examine 25 plants (5 per leg of pattern)
- Examine undersides of leaves first

Cultural Controls

- Reduced or no-till fields are less attractive to greenbugs
- Tolerant and resistant varieties available

Economic Thresholds

Plant Growth Stage	Average Number of Greenbugs per Plant
0-1 leaf stage	25-50
3 leaf stage	50-100
5 leaf stage	150-300
Mid-whorl stage	300-600
Late-whorl stage through soft dough stages	1,000

Notes

- Thresholds during the 0-1 leaf stage can result in stand loss

Aphids

(Hemiptera: Aphididae)

Corn Leaf Aphids

(*Rhopalosiphum maidis*)

Nymph and Adult Identification

- Blue green to gray in color
- Head is dark gray to black
- Black legs, antennae, cornicles, and eyes
- Adults are 1/16 to 1/2 inch long



Aphids

(Hemiptera: Aphididae)

Corn Leaf Aphids

(*Rhopalosiphum maidis*)

Crop Damage

- Nymphs and adults feed on plant sap
 - Can cause wilting and decreased yield
-

Scouting Tips

- Check the whorl and underside of leaves
 - Check plants before whorl stage as populations can reduce yield at this point
 - Determine if aphid mummies are present in the population
-

Cultural Controls

- Natural enemies normally reduce this pest
-

Economic Thresholds

- No set threshold
 - Populations typically decline after the grain head emerges
 - If large populations persist use an insecticide labeled for the pest on sorghum
-

Notes

- Multiple generations per year
- Overwinter in Gulf Coast states
- Winged adults migrate north each spring

Aphids

(Hemiptera: Aphididae)

Bird Cherry-Oat Aphids

(*Rhopalosiphum padi*)

Nymph and Adult Identification

- Olive green colored body
- Reddish-orange patch near end of abdomen
- Light colored legs with darker joints
- Light colored long antennae
- Light colored cornicles with black tips
- Adults are approximately 1/16 to 1/8 inch long



Aphids

(Hemiptera: Aphididae)

Bird Cherry-Oat Aphids

(*Rhopalosiphum padi*)

Crop Damage

- Nymphs and adults feed on plant sap
 - Can cause wilting and decreased yield
 - Greater threat to sorghum if colonization occurs during drought years when plant is already stressed
-

Scouting Tips

- Check the whorl and underside of leaves
-

Cultural Controls

- Natural enemies normally reduce this pest
-

Economic Thresholds

- No set threshold
-

Notes

- Initially colonize wheat and other small grain fields, during mild winters can colonize winter wheat throughout the winter
- Will colonize sorghum but it is not as suitable as a host as small grains

Aphids

(Hemiptera: Aphididae)

Sugarcane Aphid

(*Melanaphis sacchari*)

Nymph and Adult Identification

- Varies in color from light yellow to gray
- Dark gray to black cornicles
- Last segment of the legs is black
- Approximately half of the antennae are black
- Adults are 1/16 inch long



Aphids

(Hemiptera: Aphididae)

Sugarcane Aphid

(*Melanaphis sacchari*)

Crop Damage

- Nymphs and adults feed on plant sap
 - Can cause wilting and decreased yield
 - Yield losses of more than 50% have been observed in southern states
-

Scouting Tips

- This pest has not been observed in South Dakota at this time
 - Scout the underside of the lower leaves of the plant first. Populations will be larger than the other species observed on sorghum
-

Cultural Controls

- Some sorghum varieties may have tolerance
-

Economic Thresholds

- 50-125 aphids per leaf
-

Notes

- This pest has not yet been recorded in South Dakota, but we are monitoring for it

Chinch Bugs

(Hemiptera: Blissidae)

(*Blissus leucopterus leucopterus*)

Nymph Identification

- Early instars are red/orange
- Later instars are black
- Wings not fully developed



Adult Identification

- White wings with black triangular mark
- 3/16 inch long
- Body is dark brown to black



Chinch Bugs

(Hemiptera: Blissidae)

(*Blissus leucopterus leucopterus*)

Crop Damage

- Seedling stage sorghum most susceptible
 - Feed on plant sap, large populations can reduce yield
-

Scouting Tips

- 1st generation nymphs and adults will start feeding on the edge of the field
 - 2nd generation nymphs and adults will move into the field to feed
 - Watch for plants that turn red, are stunted or that lodge
 - Dry weather promotes chinch bug outbreaks
-

Cultural Controls

- Dense sorghum stands
 - Plant sorghum as early as possible
-

Economic Thresholds

- 2 or more adults on seedlings
 - 4-5 nymphs or adults on taller plants
 - 1 chinch bug can reduce yield by 2%
 - Border treatments can be effective
 - Use of drop nozzles better targets pest
-

Notes

- Overwinter as adults at the base of grasses
- 2 generations per year
- Neonicotinoid seed treatments can reduce early season infestations

False Chinch Bugs

(Hemiptera: Blissidae)
(*Nysius raphanus*)

Nymph Identification

- Grayish to brown in color
- Wings not fully developed



Adult Identification

- Smaller in size than chinch bug
- 3/16 inch long
- Body is gray to brown in color
- Transparent wings



False Chinch Bugs

(Hemiptera: Blissidae)
(*Nysius raphanus*)

Crop Damage

- Nymphs and adults feed on plant sap
 - Large populations may cause wilting, curling and death of leaves
 - Stand reductions can occur when large populations are present
-

Scouting Tips

- Watch for mass movements of nymphs and adults around plants
 - Monitor plants for aggregations
 - Dry weather promotes chinch bug outbreaks
-

Cultural Controls

- Tillage
 - Early weed control
-

Economic Thresholds

- 140 false chinch bugs/panicle during milk stage can cause empty seed capsules
-

Notes

- Cool, wet springs can promote population increases due to abundant weedy hosts
- Move to crops if weed hosts are removed due to drought or herbicides
- Up to three generations per year
- Strong preference for plants in the mustard family

Lygus Bugs

(Hemiptera: Miridae)

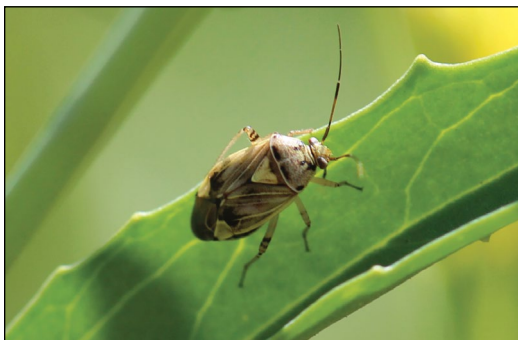
Nymph Identification

- Light green body
- Later instars with 5 black spots on the back
- Wings not fully developed
- Size ranges from approximately 1/16 to 1/8 inch depending on developmental stage



Adult Identification

- Green to brown in color
- White triangular mark on the back
- End of bodies bent downward
- Approximately 1/4 inch long



Lygus Bugs

(Hemiptera: Miridae)

Crop Damage

- Nymphs and adults feed on panicle and prevent seed set
 - Nymphs and adults feed on developing grain in sorghum heads
-

Scouting Tips

- Examine five areas per field and look at 20 plants per area
 - Beat the heads onto a light-colored cloth or into a bucket
 - Count the lygus bugs that are removed from the head
-

Cultural Controls

- Reduce populations in alfalfa before cutting when sorghum is at the soft dough or milk stages
-

Economic Thresholds

- 12 per head during the soft dough stage
-

Notes

- 2 to 3 generations per year
- Feed on numerous plant hosts and transition from host to host based on quality
- Adults emerging in the spring initially feed on weeds such as thistle, sweet clover, and wild mustard and alfalfa

Caterpillars

(Lepidoptera)

Corn Earworm

(*Helicoverpa zea*)

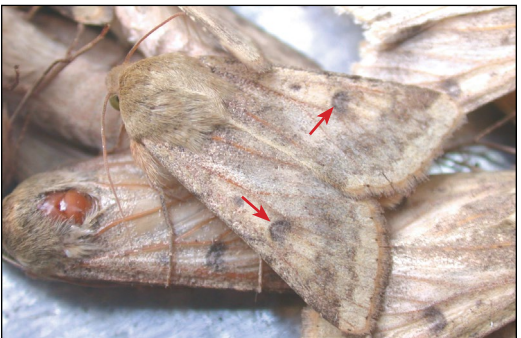
Caterpillar Identification

- 4 pairs of abdominal prolegs
- Color varies from green, tan, brown, pink, and black
- Light and dark strips on each side of body
- Head capsule varies from orange to occasionally green or brown



Moth Identification

- Forewings are usually yellow to brown
- Dark gray spots in center of forewing



Caterpillars

(Lepidoptera)

Corn Earworm

(*Helicoverpa zea*)

Crop Damage

- Early larvae feed on folded whorl resulting in ragged shot-hole injury
 - Later larvae feed on leaves, panicles, or growing points within whorls
-

Scouting Tips

- Scout whorl stage sorghum for ragged and elongate holes and later sorghum for shot-hole injury
 - From flowering till hard dough, scout panicles at five-day intervals using the “beat-bucket” method
 - Look for frass pellets within panicles, on upper side of leaves, or on the ground
-

Cultural Controls

- Parasitoids, disease and cannibalism usually suppress corn earworm abundance
 - Use hybrids with loose or open panicles
-

Economic Thresholds

- Insecticide treatment may be necessary if 30% of leaf tissue is removed and/or one to two larvae per panicle is found
-

Notes

- Corn earworm is cannibalistic usually resulting in only one larva per plant whorl

Caterpillars

(Lepidoptera)

European Corn Borer

(*Ostrinia nubilalis*)

Caterpillar Identification

- Cream to white colored body
- Raised dark spots on each body segment
- Dark brown head capsule
- Last stage caterpillars are $\frac{3}{4}$ to 1 inch long
- Small larvae may be observed on leaves or in the whorl
- Larger larvae will be found within the stalk



Moth Identification

- Small with wingspan from $\frac{3}{4}$ to 1 $\frac{1}{4}$ inches
- Range from pale yellow to light grayish brown
- Wings crossed by dark zigzag lines



Caterpillars

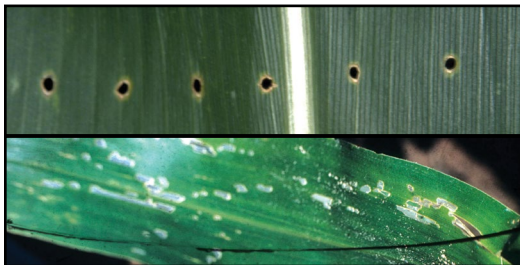
(Lepidoptera)

European Corn Borer

(*Ostrinia nubilalis*)

Crop Damage

- Larvae feed within the whorl or leaves producing shot-hole or window-pane damage



- Infestations on reproductive stage sorghum may result in breakage of the peduncle resulting in harvest losses

Scouting Tips

- Watch for small egg masses on leaves
- When leaf injury is observed dissect plants and evaluate for caterpillar presence

Cultural Controls

- Planting timing can reduce abundance

Economic Thresholds

- No threshold in sorghum, insecticides only 50% effective
- Hybrid selection can reduce abundance

Notes

- Broad host range including corn, grasses, peppers, potatoes

Caterpillars

(Lepidoptera)

Fall Armyworm

(*Spodoptera frugiperda*)

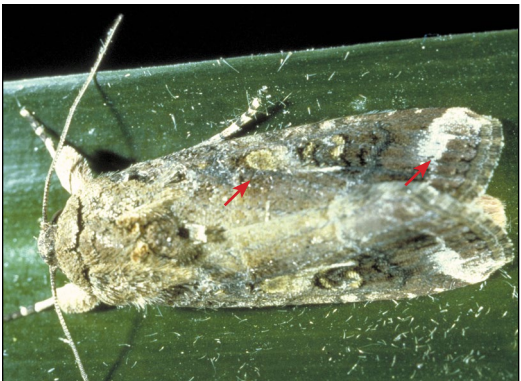
Caterpillar Identification

- Color may vary greatly from light tan to green to black
- Four black spots arranged in square on last abdominal segment
- Dark brown head with inverted Y marking
- May have light colored lines on sides of body
- Last stage caterpillars can be 1 ¼ inches long



Moth Identification

- Gray and brown moth with wingspan of 1 ¼ to 1 ½ inches
- Prominent, triangular yellow to white spots at the tip and near center of forewings



Caterpillars

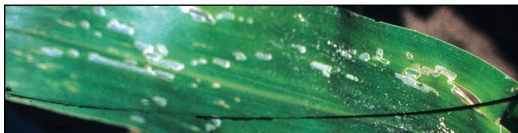
(Lepidoptera)

Fall Armyworm

(*Spodoptera frugiperda*)

Crop Damage

- Defoliation is not usually a concern
- Leaf damage usually results in window-pane injury or ragged leaf appearance



- Caterpillars will also feed on grain

Scouting Tips

- Caterpillars are nocturnal and will be found under clods of soil, vegetation and at base of plants during daytime hours
- Dark green to brown fecal pellets will be on leaves if fall armyworm are present

Cultural Controls

- Plant early as older plants can tolerate damage more easily

Economic Thresholds

- One to two caterpillars per square meter
- Management rarely necessary
- Apply labeled insecticide in the afternoon or evening

Notes

- Heavy rains increase egg laying so monitor more closely several weeks after rain event

Caterpillars

(Lepidoptera)

Cattail Caterpillar

(*Simyra henrici*)

Caterpillar Identification

- Covered in moderately dense, black and white hairs with orange, raised areas throughout
- Head capsule is black with white, inverted V
- Can reach up to 1 $\frac{3}{4}$ of an inch in length



Moth Identification

- Entirely white, hairy moth with gold to tan under-color on forewings and legs



Caterpillars

(Lepidoptera)

Cattail Caterpillar

(*Simyra henrici*)

Crop Damage

- Larva usually found in late season
- Rarely cause economic injury
- Small larvae scrape away leaf surface causing window-pane type damage



- Large larvae consume large areas of leaf tissue, similar in appearance to grasshopper damage. Damaged leaves appear ragged

Scouting Tips

- Like all ragworms (foliage feeding caterpillars), monitor leaves for injury

Cultural Controls

- Parasitoids may keep caterpillar populations in check

Economic Thresholds

- No threshold in sorghum
- Management rarely necessary
- Use a labeled insecticide

Notes

- Two to three generations per season
- Broad host range including corn, soybean, vegetables and sorghum

Caterpillars, Cutworms

(Lepidoptera)

Army Cutworm

(*Euxoa auxiliaris*)

Caterpillar Identification

- 4 pairs of abdominal prolegs
- Dark brown in color with three, light brown strips along 1 ½ to 2 inches long body
- Light brown head capsule



Moth Identification

- Usually tan with light and dark brown markings
- Presence of two, light colored spots on hindwings



Caterpillars, Cutworms

(Lepidoptera)

Black Cutworm

(*Agrotis ipsilon*)

Caterpillar Identification

- 4 pairs of abdominal prolegs
- Light gray to black with rough textured skin



Moth Identification

- Light to dark brown in color
- Distinct black dagger-like markings on forewing that extends towards the end of the wings



Caterpillars, Cutworms

(Lepidoptera)

Variegated Cutworm

(*Peridroma saucia*)

Caterpillar Identification

- 4 pairs of abdominal prolegs
- Range from pale grey to dull brown
- Distinct, yellow spots down middle of back
- Orange head capsule with black lines along sides
- Can grow to two inches in length



Moth Identification

- Forewings are brown to reddish brown with mottled designs throughout
- Wingspan of up to 1 ½ inches



Caterpillars, Cutworms

(Lepidoptera)

Dingy Cutworm

(*Felita jaculifera*)

Caterpillar Identification

- 4 pairs of abdominal prolegs
- Light gray with smooth skin
- Tubercle pairs on each segment are nearly identical in size



Moth Identification

- Usually light brown with dark brown markings
- Appearance of well-defined geometric shapes of dark brown and tan
- Light-colored fringe borders the bottom of the wings



Caterpillars, Cutworms

(Lepidoptera)

Crop Damage

- Causes three types of damage:
 1. Cut young sorghum plants at soil surface
 2. Feed on above ground foliage
 3. Feed on root structures
- Cut plants will die
- Fed on leaves appear ragged
- Root damage will kill young plants and stunt growth of older plants

Scouting Tips

- Monitor new growth for signs of defoliation or cutting
- Later in season, monitor field for signs of stunted growth
- If cutworms are present in field:
 - Determine population density by digging several, square foot areas and counting cutworm larva found
 - Or assess impact by counting number of cut sorghum plants

Cultural Controls

- Tillage, flood irrigation, and weed control all important to keep cutworm populations down
- When planting a new crop in a previously infested field, consider using an in-furrow insecticide to reduce risk of cutworm feeding next growing season



Caterpillars, Cutworms

(Lepidoptera)

Economic Thresholds

- Insecticide treatment may be needed if 30% of leaf area has been removed or sufficient stand is threatened
- Can be managed by labeled insecticides
- Apply treatment in late afternoon or evening

Notes

- Caterpillars commonly found in low areas of fields, fields with wet conditions, and fields with grass/weeds prior to planting the crop



Grasshoppers

(Orthoptera: Acrididae)

Nymph Identification

- Size varies by life stage and species
- Nymphs will go through 4-6 instars
- Color will vary by life stage and species
- Wing pads present that will increase in size through development
- Nymph identification to species is often difficult if not impossible for some species



Grasshoppers

(Orthoptera: Acrididae)

Redlegged Grasshopper

(*Melanoplus femurrubrum*)

Adult Identification

- Medium body size
- Black and yellow-orange body coloration
- Black stripe down entire hind femur
- Red hind tibia, rarely blue
- Partial black band on thorax
- Vary in size from approximately 1/3 to 1 inch long
- Rare individuals of the species will have a yellow and blue body coloration



Grasshoppers

(Orthoptera: Acrididae)

Differential Grasshopper

(*Melanoplus differentialis*)

Adult Identification

- Large body size
- Green to olive to yellow body coloration
- Black chevrons on hind femur
- Hind tibia light green to gray color
- Vary in size from approximately 1 ¼ to 1 ½ inches long
- Rare individuals of the species will have a black (melanistic) body coloration



Grasshoppers

(Orthoptera: Acrididae)

Two-Striped Grasshopper

(*Melanoplus bivittatus*)

Adult Identification

- Large body size
- Brown to tan body coloration
- Two yellow stripes that run from the head to the tips of the wings, forming a triangle
- Black stripe down entire hind femur
- Blue to gray hind tibia
- Vary in size from approximately 1 to 1 ½ inches long



Grasshoppers

(Orthoptera: Acrididae)

Migratory Grasshopper

(*Melanoplus sanguinipes*)

Adult Identification

- Medium body size
- Black and yellow-orange body coloration
- Black stripe down entire hind femur
- Blue green or red hind tibia
- Partial black band on thorax
- Vary in size from approximately $\frac{3}{4}$ to 1 $\frac{1}{8}$ inches long



Grasshoppers

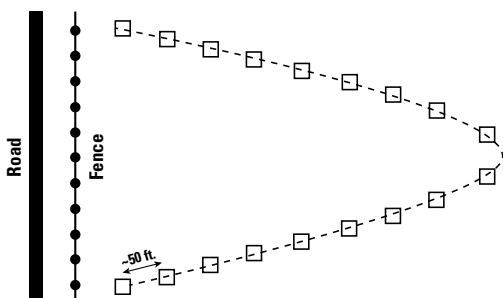
(Orthoptera: Acrididae)

Crop Damage

- Nymphs and adults feed on leaves
- Adults may feed on emerging seed heads

Scouting Tips

- Walk in a U-pattern to include edge and center of the field for evaluation. Stop at multiple locations along the pattern and scout for grasshoppers



- At each stop point, stand and count the moving grasshoppers in approximately a one square yard area
- Examine field borders early in the season

Economic Thresholds

- 5-8 nymphs or adult grasshoppers per square yard within the field
- 15-20 nymph grasshoppers per square yard in field borders

Notes

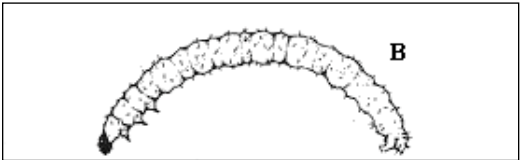
- Treat nymphs to improve management as adults are harder to kill
- Cause more issues during dry seasons

Flea Beetles

(Coleoptera: Chrysomelidae)

Larvae Identification

- Thorax and last abdominal segment brown
- White color
- Last instar 1/6th of an inch long



Adult Identification

- Black and shiny
- Enlarged hind legs
- Approximately 1/16th of an inch long



Flea Beetles

(Coleoptera: Chrysomelidae)

Crop Damagen

- Adults feed on leaves leaving white streaks
- Large adult populations can seedling sorghum by removing leaf tissue
- Larvae feed on roots but impact unknown

Scouting Tips

- Examine sorghum early season for flea beetle feeding

Economic Thresholds

- No set thresholds for sorghum
- More than 5 beetles per plant before the 4-leaf stage may warrant spray

Notes

- Feed on numerous hosts
- Adults become active when spring temperatures reach 65-70 degrees F
- 1 to 2 generations per year
- Overwinter as adults



Two-spotted Spider Mites

(Trombidiformes: Tetranychidae)
(*Tetranychus urticae*)

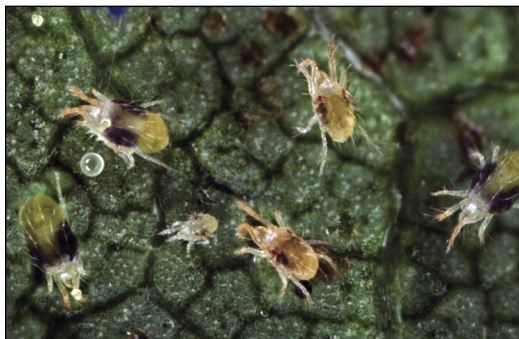
Nymph Identification

- 1st instar has 3 pairs of legs
- All other instars have 4 pairs of legs
- Greenish-yellow color with elliptical body
- Two lack spots unless recently molted
- Vary in size with instar but very small



Adult Identification

- Greenish-yellow color with elliptical body
- Body contents are observed as two large black spots
- Approximately 1/60th of an inch long



Two-spotted Spider Mites

(Trombidiformes: Tetranychidae)
(*Tetranychus urticae*)

Crop Damage

- Nymphs and adults feed on leaves leaving small white spots or stippling
 - Leaves will turn gray or yellow with necrotic spots forming with extensive feeding
-

Scouting Tips

- Examine leaves for stippling or webbing
 - Increase scouting during hot, dry periods as populations may increase rapidly
 - Hit potentially infested leaves on a white piece of paper and examine for adults using a hand lens
-

Cultural Controls

- Remove grassy weed hosts 2-3 weeks prior to planting sorghum
-

Economic Thresholds

- No set threshold
 - Treat if large populations are present/ continuing to increase and hot, dry weather is forecasted
-

Notes

- Feed on numerous hosts
- Many overlapping generations per year

Banks Grass Mite

(Trombidiformes: Tetranychidae)
(*Oligonychus pratensis*)

Nymph Identification

- Pale to bright green body
- Smaller in size than adults

Adult Identification

- Pale to bright green
- Oval shaped bodies
- 4 pairs of legs
- Red or brown spots on each side of body
- Approximately 1/50 inch long



Banks Grass Mite

(Trombidiformes: Tetranychidae)
(*Oligonychus pratensis*)

Crop Damage

- Nymphs and adults feed on leaves leaving small white spots or stippling
 - Leaves will turn yellow then brown and then necrotic spots will form
-

Scouting Tips

- Examine leaves for stippling or webbing
 - Increase scouting during hot, dry periods as populations may increase rapidly
-

Cultural Controls

- Remove grassy weed hosts 2-3 weeks prior to planting sorghum
-

Economic Thresholds

- No set threshold
 - Treat if large populations are present/ continuing to increase and hot, dry weather is forecasted
-

Notes

- Feed on many grass hosts
- Overwinter on wheat
- Overwintering adults are bright orange
- Many overlapping generations per year

Wireworms

(Coleoptera: Elateridae)

Larvae Identification

- Slender worm-like body with hard exoskeleton
- 3 pairs of legs near the head
- Color is white when newly hatched and changes to brown/orange as larvae mature
- Size varies through developmental stages
- Grow up to ½ to 1 ½ inches long depending on the species



Adult Identification

- Size and coloration vary by species – typically brown or black
- All will be “bullet” shaped
- When flipped on back will right themselves and in doing so make a “clicking” sound



Wireworms

(Coleoptera: Elateridae)

Crop Damage

- Larvae feed on sorghum seeds and developing seedlings prior to emergence
 - Feeding results in reduced plant stands and stunted plants
-

Scouting Tips

- Soil samples – Search for wireworms in 1 square foot of soil dug 4 inches deep
 - Bait traps – Place 6-12 oz of nontreated sorghum seed in a 4 x 8 inch hole, cover with soil, and mark with a stake; Check trap 2 weeks later and count the wireworms
 - Scout prior to planting and in multiple areas within the field
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Cultural Controls

- Plant when soil moisture and temperature are adequate for rapid seed germination
 - Plant sorghum in a field where a taproot crop was grown the previous year (e.g., sunflower)
 - Tillage to reduce plant material
-

Economic Thresholds

- 1 wireworm per square foot of soil
 - 2 or more wireworms per bait trap
 - Use treated seed or at-plant insecticide
-

Notes

- Higher seeding rates allow sorghum to withstand up to 15% stand loss
- Some wireworm species require several years to mature so problems may persist in certain fields

White Grubs

(Coleoptera: Scarabaeidae)

Larvae Identification

- White to cream color with yellow head
- Size varies through developmental stages and may grow up to 1 inch long
- 3 pairs of legs near the head
- Curl into a C-shape when disturbed
- Distinguished from other grubs by “zipper” pattern of hairs at the base of the abdomen



Adult Identification

- Robust body
- Shiny with light to dark red/brown color
- Typically ½ to 1 inch long
- Highly attracted to lights at night



White Grubs

(Coleoptera: Scarabaeidae)

Crop Damage

- Larvae feed on roots of sorghum plants
 - Feeding results in reduced plant stands and stunted plants
-

Scouting Tips

- Search for white grubs in 1 square foot of soil dug 6 to 12 inches deep
 - Grubs will be deeper in the soil during cooler months
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Cultural Controls

- Plant sorghum in a field where a non-grass crop was grown the previous year
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Economic Thresholds

- 1 grub per square foot of soil
 - In-furrow insecticides are required for management
-

Notes

- Fields transitioning from grass have the greatest risk for injury
- Grubs remain underground for 3 years before emerging as adults

Seedcorn Maggots

(Diptera: Anthomyiidae)

(*Delia platura*)

Larvae Identification

- Small, elongate white with ridged body
- Brown head capsule
- Size will vary by instar



Adult Identification

- Yellow to green in color
- 12 black spots on abdomen
- Black head
- Approximately 3/8 inch long



Seedcorn Maggots

(Diptera: Anthomyiidae)

(*Delia platura*)

Crop Damage

- Larvae damage newly planted seeds by feeding on internal contents
 - Larvae will also tunnel into seedling stems or germinated seeds
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Scouting Tips

- Early season pest
 - Dig 2 linear row feet of soil in areas with emergence issues
 - Examine seeds and mark ungerminated, hollowed out or otherwise damaged
 - Reduction in stand can be observed 1 week after plant emergence
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Cultural Controls

- Replant if emergence is greatly reduced with hollowed out seeds present
 - Use higher seeding rates in fields that may have issues
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Economic Thresholds

- 15% stand loss
 - Granular and seed treated insecticides can prevent seedcorn maggot feeding
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Notes

- No rescue treatments
- No-till fields can have reduced risk
- Increased risk:
 - fields that were previously weedy or sod
 - following small grains
 - early planting during cool, wet springs
 - Spreading or injecting manure in spring before planting