

Feed Grains: **Corn and Sorghum** *Weed, Insect and Disease* *Field Guide*



Funded by the
Louisiana Soybean and Grain Research and Promotion Board

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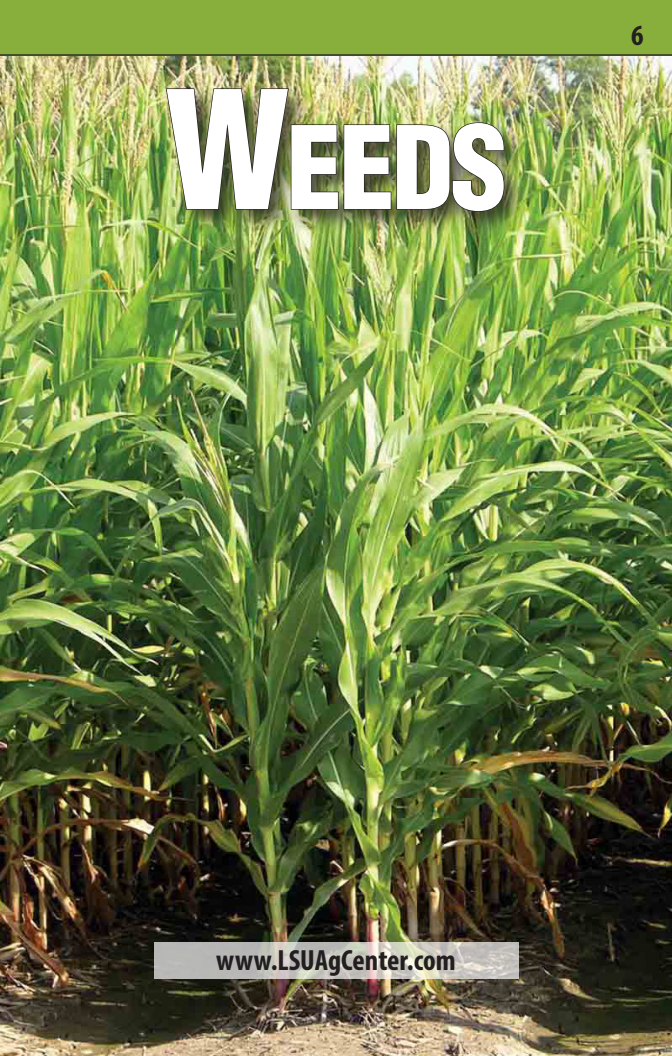
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WEEDS

A photograph of a cornfield with the word "WEEDS" in large white letters. The corn plants are green and tall, with some showing signs of stress or damage at the base. The background is a dense field of similar plants.

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barnyardgrass

Latin name: *Echinochloa crus-galli*

General information:

Prolific weed with typical emergence from March through October. For best management, scout in March-May and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics:

Fibrous root system. Stems are erect, can grow to 5-7 feet tall, often bent, and branched at lower nodes, not pubescent. Leaves are 4-20 inches long, no pubescence, but rough on both sides of leaf. Ligule absent. Panicle is 4-16 inches long with numerous branches close together or spreading. Inflorescence may be awned or awnless. Main identifying characteristics are the absence of a ligule, seedhead is crowded to re-branched spikelets, and flat stem.



mature plant



seedhead



seedling plant

broadleaf signalgrass

Latin name: *Urochloa platyphylla*

General information:

Prolific weed with typical emergence from March through September. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics:

Fibrous root system. Stems are up to 35 inches tall, typically laying along the ground, but curve upward toward ends, bent at nodes, and often branched and rooting at lower nodes. Leaves are 1.5-6 inches long, no pubescence except on lower leaves, which are often pubescent throughout, and stem sheaths have pubescent margin. Inflorescence is 12 inches long, 4 inches wide, with 2-6 branches. Main identifying characteristic is the crease near tip of leaves.



seedhead



mature leaf



mature plant



ligule and red collar

browntop millet

Latin name: *Urochloa ramosa*

General information: Prolific weed with typical emergence from April through October. For best management, scout in April-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Fibrous root system. Stems are erect to laying on the ground, up to 2.3 feet tall, and pubescent nodes. Leaves are 0.8-13 inches long no pubescence, but sheaths range from no pubescence to pubescent; Inflorescences are erect 1-4 inches long, with straight to spreading branches. Main identifying characteristic is the broad and flat leaves with no pubescence.



leaf collar



adolescent plant



seedhead

Texas millet

Latin name: *Urochloa texana*

General information: Prolific weed with typical emergence from April through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Fibrous root system. Stems are 16-32 inches tall, erect from base or lying along the ground, rooting at lower nodes, nodes and sheaths with soft pubescence. Leaves are 3-11 inches long, soft, dense pubescence on both sides of leaf. Main identifying characteristic is the soft, velvety, pubescent leaves.



adolescent plant



soft pubescence on leaf

large crabgrass

Latin name: *Digitaria sanguinalis*

General information: Typical emergence from April through October. For best management, scout in March-April and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Fibrous root system. Leaves are 1-8 inches long, usually pubescent on both sides of leaf. Inflorescence has 4-6 branches that are 1.5-7 inches long. Main identifying characteristic is long, thin leaves that are pubescent.



ligule



mature plant



pubescence on stem and leaf



seedhead

goosegrass

Latin name: *Eleusine indica*

General information:

Typical emergence from April through October. For best management, scout in April-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying

characteristics: Fibrous root system. Stems are erect to spreading, branched, with no pubescence on nodes and internodes. Leaves are 5-14 inches long, no pubescence or occasionally sparsely pubescent. Inflorescences are 1-13 fingerlike spikes, each 1.6-6 inches long. Main identifying characteristic is that stems look flattened, whitish green in young plants almost parallel to the ground.



seedhead



stem and leaf collar

yellow foxtail

Latin name: *Setaria pumila*

General information: Typical emergence from April through October. For best management, scout in April-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Fibrous root system. Stems are 8-51 inches tall, erect, branching at base, no pubescence. Leaves are 12 inches long, no pubescence except for hair on top side of leaf at bottom third of leaf. Inflorescence is a panicle, 1-6 inches long, yellowish when mature, cylinder-shaped and has multiple bristles per spikelet. Main identifying features are the yellowish inflorescence shaped like a fox tail and pubescence at base of leaf blade.



pubescence on lower third of leaf



seedhead

johnsongrass

Latin name: *Sorghum halepense*

General information: Prolific weed with emergence from February through November. For best management, scout in February-May and after harvest. Can be controlled with herbicides in corn, but glyphosate-resistance has been documented in Louisiana. Currently, no herbicidal options are available to control johnsongrass in grain sorghum. Optimum timing for control in corn is with herbicide applications preemergence and early-postemergence.

Identifying characteristics:

Fibrous root system with thick rhizomes. Stems are erect, up to 11 feet tall. Leaves are 8-24 inches long, no pubescence except at base of leaves on some plants, prominent white midrib on leaves. Inflorescence is an open panicle, 6-20 inches long with numerous whorled branches. Main identifying features are the thick, scalelike rhizomes, prominent white midrib on leaves. Often, rust coloration can be found on leaves.



mature plant



seedhead



white midrib on leaf

purple nutsedge

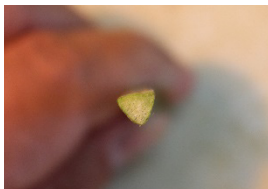
Latin name: *Cyperus rotundus*

General information: Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous, extensively branched from tubers or bulbs, with slender rhizomes that are white and fleshy. Stems are culms, triangular, solitary from tuber or basal bulb. Leaves are 3-ranked, mostly basal, prominent midvein, flat or slightly wavy, abruptly tapering at tip. Inflorescence is umbel-like, reddish purple or reddish brown. Tubers are oblong, irregularly shaped, rough, in chains connected by rhizomes, bitter to taste. Main identifying features are the erect, persistent, perennial growth, purple inflorescence, rough tubers connected in chains and with leaves abruptly tapering to an acute tip.



adolescent plant



triangular stem



seedhead



Leaf difference between purple nutsedge (left) and yellow nutsedge (right)

yellow nutsedge

Latin name: *Cyperus esculentus*

General information: Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

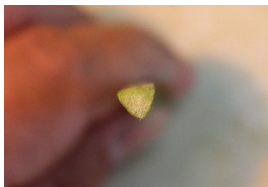
Identifying characteristics: Roots are fibrous, extensively branched from tubers, rhizomes, or basal bulbs. Stems are triangular, borne from individual tubers or basal bulbs. Leaves are 3-ranked, mostly basal, green, linear, prominent midvein, flat or slightly wavy, with long tempered tip. Inflorescence is umbel-like, composed of several unequally stalked spikes, yellowish brown. Tubers are round, smooth, and solitary, sweet to taste. Main identifying features are the erect, persistent, colonial perennial growth, yellow inflorescence, leaves that gradually taper to sharp point, and tubers are not in chains.



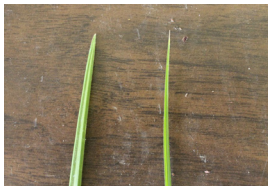
adolescent plant



seedhead



triangular stem



Leaf difference between purple nutsedge (left) and yellow nutsedge (right)

rice flatsedge

Latin name: *Cyperus iria*

General information:

Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying

characteristics: Roots are yellowish red, fibrous, and extensively branched. Stems are triangular and usually longer than basal leaves. Leaves are 3-ranked, green, with rough margins especially near apex. Inflorescences are simple or compound with elongate dense spikes. Main identifying traits are the erect growth, multiple fruiting stems from base, and strong cypress tree smell when crushed.



seedhead



triangular stem



adolescent plant

Palmer amaranth

Latin name: *Amaranthus palmeri*

General information: Prolific weed with emergence from February through November. For best management, scout in February-May and after harvest. Can be controlled with herbicides in corn and grain sorghum, but glyphosate-resistance has been documented in Louisiana. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from well-developed taproot that may or may not be red. Seedling stem is red to green, no pubescence to slightly pubescent, cotyledons green with no pubescence. Stems are erect, branched, 1.6-7 feet tall, may be red with or without pubescence; Leaves are alternate, 1.2-4 inches long, egg-shaped, veins prominent on underside of leaf with long-petiole. Inflorescence is a terminal spike up to 1.6 feet long, lateral spikes few to none, male and female flowers on separate plants, male inflorescence is soft, female inflorescence is like needles. Seeds are reddish brown to black, the size of the ball in a ball-point pen, and numerous per spike. Main identifying features are the erect, branched growth, long leaf petioles, male and female flowers on different plants.



adolescent plant. Notice long leaf petiole



seed



male inflorescence



female inflorescence

common waterhemp

Latin name: *Amaranthus rudis*

General information: Prolific weed with emergence from February through November. For best management, scout in February-May and after harvest. Can be controlled with herbicides in corn and grain sorghum, but glyphosate-resistance has been documented in Louisiana. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from well-developed taproot. Seedlings stem is red to green, slight to no pubescence, cotyledons are green to reddish with no pubescence. Stems are erect, 2.3-10 feet tall, slender, green or red (females usually red), slight to no pubescence. Leaves are alternate, 0.4-6 inches long, 0.2-2 inches wide, simple, narrowly oval to lanceolate, no pubescence, long petiole. Inflorescence is a terminal spike simple to highly branched, with male and female flowers on different plants. Seeds are dark brown to black, the size of the ball in a ball-point pen, and numerous per spike. Main identifying features is leaves that may be 3 times as long as they are wide.



leaves of mature plant.
Notice leaves 2-3 times
longer than wide



seedhead

slender amaranth

Latin name: *Amaranthus viridis*

General information: Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from well-developed taproot that may or may not be red. Seedlings stem is red to green, no pubescence, cotyledons are green with no pubescence. Stems are erect, 0.9-3.2 feet tall, lower branches spreading to 1.6 feet across, no pubescence, prostrate growth, with upper branches ascending. Leaves are alternate, simple 1.2-2.8 inches long, 0.8-2.4 inches wide and petiole 1.2-2.4 inches long. Inflorescence has terminal and axillary spikes few or several in number, male and female flowers on single plant. Seeds are dark brown to black, the size of the ball in a ball-point pen, and numerous per spike. Main identifying trait is the erect to spreading growth habit with numerous branches. Looks very similar to a redroot pigweed (pg.21).



seedhead



seedling



mature plant

redroot pigweed

Latin name: *Amaranthus retroflexus*

General information: Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from well-developed taproot, may or may not be red. Seedling stem is red to green, no pubescence to slightly pubescent, cotyledons green with pubescence, Stem is erect, up to 7 feet tall, stout, usually branched with fine short pubescence. Leaves are alternate, 1.2-6 inches long, 0.4-2.4 inches wide, simple, veins with pubescence on underside, long petioles. Inflorescence is a terminal spike of several densely crowded spikes up to 7.5 inches long, male and female flowers on single plant. Seeds are dark red-brown, the size of the ball in a ball-point pen, and numerous per spike. Main identifying features are the erect, stout growth, spikes in inflorescence are thick, leaves and young stems are pubescent. Looks very similar to a slender amaranth (pg. 20).



adolescent plant



seedhead



mature plant

entireleaf morningglory

Latin name: *Ipomoea hederacea* var. *integriscula*

General information: Prolific weed with typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

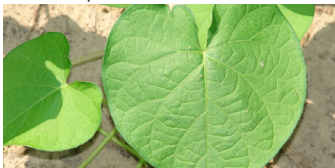
Identifying characteristics: Roots are fibrous from taproot. Seedlings stem is green or purple-tinged, not pubescent, cotyledon lobes moderately to deeply indented with rounded points. Stem is climbing or twining vine up to 10 feet long, highly branched, sometimes reddish, densely pubescent. Leaves alternate, 2-4.7 inches long, 1.6-4 inches wide, simple, margins entire, heart-shaped, densely pubescent. Inflorescence is blue with white center, turning purple as it withers. Seed is wedge-shaped, grayish black, dull, pubescent. Main identifying feature is the heart-shaped leaf that is densely pubescent.



seedling



adolescent plant



leaf

ivyleaf morningglory

Latin name: *Ipomoea hederacea*

General information: Prolific weed with typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from taproot. Seedlings stem is stout, green or purple-tinged, not pubescent, cotyledon lobes moderately to deeply indented with rounded points. Stem is climbing or twining vine up to 10 feet long, highly branched, sometimes reddish, densely pubescent. Leaves alternate, 2-4.7 inches long, 1.6-4 inches wide, simple, margins entire, 3-lobed, densely pubescent, and 3-lobed. Inflorescence flower is blue with white center, turning purple as it withers. Seed is wedge-shaped, grayish black, dull, prominent scar, pubescent. Main identifying feature is the 3-lobed leaf that is densely pubescent.



adolescent plant



seedling

palmleaf morningglory

Latin name: *Ipomoea wrightii*

General information: Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from taproot. Seedlings stems are stout, cotyledons are deeply indented with pointed ends and no pubescence. Stems are low-climbing or trailing vine, up to 6.5 feet long, branched, slender, and no pubescence. Leaves are alternate, 0.8-2.4 inches long, 1.2-2.4 inches wide, palmately compound, 3-7 lobed. Lobes are slightly equal in size, margins entire. Inflorescence is solitary, lavender to lavender pink or rose with dark center. Seed is wedge-shaped, 0.1-0.2 inches long, with a few long hairs. Main identifying feature is the palmately compound leaf.



adolescent plant



leaf

pitted morningglory

Latin name: *Ipomoea lacunosa*

General information: Prolific weed with typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from slender taproot. Seedlings stems are smooth, green or purple, cotyledon deeply indented, lobes long and pointed, no pubescence. Stem is climbing or twining up to 6.6 feet long, highly branched, slight to no pubescence. Leaves are alternate, 0.8-4 inches long, 0.6-4 inches wide, simple, variable heart-shaped to 3-5 lobed, slight scattered pubescence to no pubescence, margins often purple. Inflorescence is solitary, white or purple. Seeds are wedge-shaped, black, and shiny. Main identifying features are the deeply indented cotyledons, small white or purple flowers, and purple leaf margins.



cotyledon. Notice the purple leaf margin



leaf. Notice the purple margin

hemp sesbania

Latin name: *Sesbania herbacea*

General information: Prolific weed with typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from taproot. Seedling cotyledons are lance to spoon shaped, two times longer than wide. Stem is erect 3-13 feet tall, branching, green, no pubescence, round to slightly angled. Leaves are alternate with first true leaf simple, all other leaves are pinnately compound, no pubescence on top of leaflet, but slight pubescence on bottom of leaflet, stipules present. Inflorescence flowers are yellow, but may be streaked or spotted with purple. Seeds are brown, mottled with black and twice as long as wide. Main identifying features are the erect, branching growth habit, distinctive legume pod, large yellow flower, and simple first true leaf with all other leaves pinnately compound.



young plant. Notice the pinnately compound leaves.



seedling. Notice the simple 1st true leaf at bottom of photo.



adolescent plant

sicklepod

Latin name: *Senna obtusifolia*

General information: Prolific weed with typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from taproot. Seedling cotyledons are rounded with 3-5 distinct veins. Stems are erect 1-6.5 feet tall, branched, green, round, with no pubescence. Leaves are alternate, pinnately compound with 4-6 leaflets. Inflorescence is yellow showy flowers. Seeds are angular (diamond-shaped), brownish, and shiny. Main identifying features are the pinnately compound leaf with outermost pair of leaflets largest and a distinct rank odor when crushed.



leaflet



leaf



mature plant



seedling

prickly sida

Latin name: *Sida spinosa*

General information: Prolific weed with typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics:

Roots are fibrous from slender, branching, long taproot. Seedlings cotyledons are smooth to rough, heart-shaped with small notch at tip. Stems are erect 0.7-3.3 feet tall, multi-branched, softly pubescent, commonly with short spine-like projection at base of each blade. Leaves are alternate, simple, oval, with serrate margins. Inflorescence is solitary or clustered in leaf axis, pale yellow. Seeds are triangular shaped and contained in a capsule that has two sharp, spreading spines on top. Main identifying traits are the heart-shaped cotyledon with small notch at tip and serrate leaf margins on all leaves.



leaf. Notice the serrate leaf margin



adolescent plant



seedling

hophornbeam copperleaf

Latin name: *Acalypha ostryifolia*

General information: Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics: Roots are fibrous from taproot. Seedling cotyledons are pubescent, stems have short pubescence. Stems are erect, simple to usually branched, pubescent. Leaves are alternate, simple, ovate to rhombic-ovate, serrate margins, sparsely pubescent. Inflorescences are on separate spikes. Seeds are long, silvery gray. Main identifying features are cotyledons that are situated higher than the first 2 true leaves soon after emergence, serrate leaf margins, but not rough to the touch like prickly sida (pg. 28).



seedling. Notice the cotyledons (round) are higher than the 1st true leaves (serrate) on seedlings.



adolescent plant

smellmelon

Latin name: *Cucumis melo*

General information: Typical emergence from March through October. For best management, scout in March-June and after harvest. Optimum timing for control in corn and grain sorghum is with herbicide applications preemergence and early-postemergence.

Identifying characteristics:

Roots are fibrous from shallow taproot. Seedling cotyledons are ovate with small notch at tip, no pubescence. Stems are trailing or climbing, up to 10 feet long, branched, with soft pubescence. Leaves are alternate, up to 5 inches wide, pubescent. Inflorescence are single yellow flowers. Fruit is golden yellow, pubescent, and extremely aromatic with a roughly round shape. Main identifying traits are the trailing or climbing vine, yellow flowers and aromatic fruit that resembles a yellow melon.



seedling



mature plant



melon

redvine

Latin name: *Brunnichia ovata*

General information: Prolific weed with typical emergence from March through November. For best management, scout in March-June and after harvest. Can be partially suppressed or controlled with some herbicides in corn and grain sorghum. Optimum timing for suppression in corn and grain sorghum is with herbicide applications early-postemergence; however, best control option is dicamba application 3 weeks prior to first frost.

Identifying characteristics: Root stock overwinters, large, extensive, and deeply rooted. Seedlings are not usually seen, but emerge from perennial rootstock, leaves alternate with reddish tint to stems and tip of sprout. Stems are partly woody vine climbing by tendrils, up to several feet long. Leaves are alternate, 2-6 inches long, simple and arrow-shaped. Inflorescence flowers are whitish to greenish. Main identifying traits are the climbing to shrubby vine with tendrils on end branches and alternate leaves with reddish tint.



young plant



mature plant

INSECTS



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Seedcorn maggot

Latin name: *Delia platura* (Meigen)

When to scout: During seedling emergence, dig up seed where poor emergence or weak seedlings are observed and look for maggots. There is no action threshold for insecticide rescue treatments.

Damage: Maggots feed on seed and seedlings, reducing germination and seedling vigor. Damage is more likely under wet and cool conditions, and in soils with high levels of organic matter.

Characteristics: Seedcorn maggots are yellowish white larvae of a fly. The maggots are legless and measure 1/5 to 1/4 inch long when fully grown.



White grubs

Latin name: *Phyllophaga* spp.

When to scout: White grubs live in the soil. During early vegetative stages, dig up plants in areas where stunted plants are observed and look for grubs feeding on roots. There is no action threshold for insecticide rescue treatments.

Damage: White grubs feed on corn roots. Root pruning weakens plants, resulting in stunted growth and possibly lodging. Severe root pruning can result in stand loss. Damage is more likely in fields that were recently in pasture or sod.

Characteristics: White grubs are whitish C-shaped larvae of May and June beetles. The grubs have 3 pairs of well-developed legs and measure 1/4 to 1 inch.



Southern corn rootworm

Latin name: *Diabrotica undecimpunctata howardi* (Barber)

When to scout: Southern corn rootworms live in the soil. During early vegetative stages, dig up wilting plants and look for feeding worms and injury near the crown of the plants just below the soil surface. Injured roots are also a sign of infestation. There is no action threshold for insecticide rescue treatments.

Damage: Southern corn rootworms chew a round hole into young plants below the soil surface. Feeding can kill the growing point of plants, resulting in wilting and eventually plant death. Southern corn rootworms can also feed on roots. Plants with root injury will often lodge during the growing season, resulting in "goosenecking."

Characteristics: Southern corn rootworms are the larvae of the spotted cucumber beetle, a yellow beetle with black spots on the back. The worms are cream colored, have three pairs of small legs, and measure 1/2 inch when fully grown. They have a black head and dark brown spot on the end of the body.



Wireworms

Latin name: Numerous species of Elateridae

When to scout: Wireworms live in the soil and can be sampled using one bait station per 10 acres at least 1-4 weeks before planting. For each bait station, bury a handful of a mixture of fermented corn and wheat seed 2-4 inches deep. Cover with a small mound of soil and cover with clear or dark plastic. Stake the plastic to prevent it from blowing away and mark the location with a flag. Remove the soil and count wireworms attracted to each bait station after one week. An average of one wireworm per bait station would justify insecticidal control.

Damage: Wireworms can feed directly on and kill the germinating seed. They can also feed on seedling stems and roots, which can result in stand loss or stunting. Wireworm damage is more likely in sandy soils and in fields that were recently in pasture, sod, or reduced tillage grain crops.

Characteristics: Wireworms are hard bodied, elongated, shiny, wire-like larvae of click beetles. Wireworms are yellow-brown, have three pairs of legs, and measure 1/2 to 1 inch.



Chinch bug

Latin name: *Blissus leucopterus leucopterus* Say

When to scout: Corn fields should be scouted carefully during early season to detect chinch bugs before severe damage appears. Begin scouting soon after plant emergence. For seedling corn less than 6 inches tall, five or more bugs on 20 percent or more plants justify insecticide treatment.

Damage: Chinch bugs damage corn by sucking out plant sap with their beaks. This often causes reddening in areas of the stem and leaves where feeding is intense. If feeding continues, plants will eventually wilt and become stunted compared to neighboring plants that are not infested.

Characteristics: Chinch bugs are small true bugs, approximately 1/6 to 1/5 inch in length. Their body is generally black with white front wings that have a black spot near the middle of each outer margin. When viewed from above, adults appear to have a white X or a white hourglass on the back. Nymphs are smaller with a white band on the back.



Adult



Nymph

Cutworms

Latin name: Black cutworm, *Agrotis ipsilon* (Hufnagel); Granulate cutworm, *Feltia subterranean* (F.); Variegated cutworm, *Peridroma saucia* (Hubner)

When to scout: Cutworms are nocturnal and not likely to be seen during the day. Look for areas that sustain stand loss. This will often be in low-lying or previously flooded areas of the field. In addition, fields with vegetation are likely to be infested. Damaged seedlings will be cut off near the soil line. Older seedlings may be cut, or individual leaves may be cut from the plant. Treat with insecticides when seedlings show 6 to 8 percent damage from above ground cutting or 2 to 4 percent from below ground boring.

Damage: In cooler weather, larvae will be at or near the soil surface and will cut plants off at the soil line. In warmer weather, larvae can be found lower in the soil boring into small plants. This feeding often results in wilting or death of the plant.

Characteristics: Black cutworms are gray to brown and appear greasy with a dark brown head capsule. Granulate cutworms are gray and appear dusty with a dark brown head capsule. Variegated cutworms are smooth-skinned larvae that are pale gray or light brown mottled with dark brown.



Sugarcane beetle

Latin name: *Euetheola humilis* (Burmeister)

When to scout: During early vegetative stages, inspect the base of wilted plants for holes just below the soil surface. Adult beetles may be observed in the soil. There is no action threshold for insecticide rescue treatments.

Damage: Adult sugarcane beetles feed on seedlings and young plants up to 3 feet tall. The beetles chew a somewhat jagged round hole in the plant, just below the soil surface. Feeding can kill the growing point of plants, resulting in wilting and eventually plant death. Damaged older plants can survive, but may lean or lodge.

Characteristics: Sugarcane beetles are stout, dull black beetles, and measure approximately 1/2 inch. The elytra (wing covers) have double rows of coarse punctures and are as wide as they are long. The clypeus (upper lip) is crested with two "teeth."



Corn leaf aphid

Latin name: *Rhopalosiphum maidis* (Fitch)

When to scout: It is rare for corn leaf aphid infestations to justify treatment. Therefore, there is little need to scout specifically for this pest alone. Insecticide rescue treatments are seldom needed.

Damage: On seedling corn plants, aphids may be found feeding in the whorl. Feeding may cause plants to turn yellow or reddish in color. Seedling corn plants under drought stress are more susceptible to damage. Plants that are not under stress and are growing vigorously are typically not affected.

Characteristics: Corn leaf aphids are blue-green, soft-bodied insects that are 1/16 inch long. Corn leaf aphids possess cornicles (tail pipes) short and surrounded by a dark basal area.



Large colony of corn leaf aphids.



Corn leaf aphid with dark cornicles

Stink bugs

Latin name: Green stink bug, *Acrosternum hilare* (Say); Southern green stink bug, *Nezara viridula* (Say); Brown stink bug, *Euschistus servus* (Say)

When to scout: Stink bugs can be found in the whorl probing the plant, but they can also be found moving up and down the stalk or at the base of the plant near the soil. Thoroughly check the base of young plants and under crop residue. Scouting for stink bugs should begin before an ear is visible on the plant. At this stage, scout for stink bugs up and down the stalk, especially in the ear zone.

Damage: Plants damaged in the whorl stage may be stunted, produce excessive tillers or turn yellow. Damage to the growing point can kill plants. Significant ear damage is likely when ears are less than 3/4 inch long. Damage during early ear development may result in "cow-horned" ears, causing total ear loss.

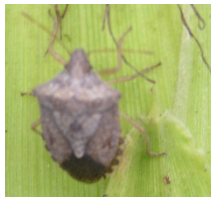
Characteristics: Green stink bugs are green with black bands on the antennae. Southern green stink bugs are green with red bands on the antennae. These stink bugs are 1/2 to 3/4 inch long. Green stink bugs can be distinguished from southern green stink bugs by a pointed spine between the last two legs. The dorsal (top) side of brown stink bugs is solid brown to mottled brown with rounded shoulders.



Southern green stink bug



Ear injury



Brown stink bug

Corn earworm

Latin name: *Helicoverpa zea*
(Boddie)

When to scout: Pheromone traps can be used to capture corn earworm adults to monitor the occurrence of moths. If defoliation in the whorl stage is detected, look for larvae feeding in the whorl. Insecticide rescue treatments are only recommend if populations are extremely high. During and after silking, scouting for corn earworms in the ears is not needed because insecticide rescue treatments are not recommended.

Damage: Larvae can damage corn during vegetative stages by feeding on the young, developing leaf tissue. Most damage, however, is caused by feeding on the silks, ear tips, and developing ears during the silking to R1 plant stages. Mature larvae move from the ears and drop into the soil for pupation.

Characteristics: Fully developed corn earworm larvae are about 1.5 inches long and vary in color from pale green or pinkish to brown. Adults are light tan and about 1.25 inches long. Eggs are small and laid singly on the leaves and fresh corn silks.



Fall armyworm

Latin name: *Spodoptera frugiperda* (J.E. Smith)

When to scout: Pheromone traps can be used to monitor fall armyworm adults. If defoliation in the whorl stage is detected, look for larvae feeding in the whorl. Insecticide rescue treatments are only recommended if populations are extremely high. During and after silking, scouting for armyworms in the ears is not needed because insecticide rescue treatments are not recommended.

Damage: Young larvae usually feed inside the whorl of the plant, and cause small holes and “window panes.” Later, larvae cause extensive defoliation, often leaving only leaf midribs and stalks of corn plants. Larvae can burrow into the ear and feed on kernels. Mature larvae often drop into the soil for pupation.

Characteristics: Fall armyworm larvae vary from light tan to black with three light yellow stripes on the back and a wide dark stripe on each side. The front head of the mature larva is marked with a white inverted “Y.” The adult has a wingspan of about 1.5 inches. Eggs are small and in a group. The female often produces a layer of grayish scales on the egg mass.



Sap beetles

Latin name: Corn sap beetle, *Carpophilus dimidiatus* (L.); Dusky sap beetle, *Carpophilus lugubris* Murray; Picnic beetle, *Glischrochilus quadrisignatus* (Say)

When to scout: Look for ear tip and kernel injury, particularly in late-planted fields. The distinct difference between sap beetle and corn earworm feeding is that earworm larvae eat whole corn kernels whereas sap beetles usually feed only the inside of kernels, thus leaving a portion of the kernel cuticle on the cob. Insecticide rescue treatments are not recommended.

Damage: Sap beetles are considered minor pests of corn and are usually more abundant in late-planted fields. Larvae and adults feed on corn kernels and ear tips, preferentially those that have previously been injured by other ear feeding insects such as the corn earworm. Sap beetles can transfer mycotoxigenic fungi.

Characteristics: Sap beetle larvae are small, pinkish white or creamy colored grubs about 1/4 inch long. Adult beetles are also small, between 1/8 and 1/4 inch long, ranging from red-tinged black to brown-yellow. The sap beetles can be distinguished from other beetles by their characteristic club-shaped antennae.



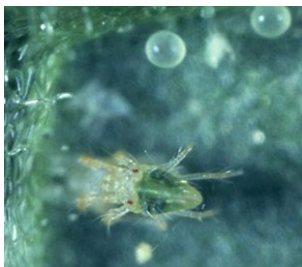
Spider mites

Latin name: Twospotted spider mite, *Tetranychus urticae* (Koch); Banks grass mite, *Oligonychus pratensis* (Banks)

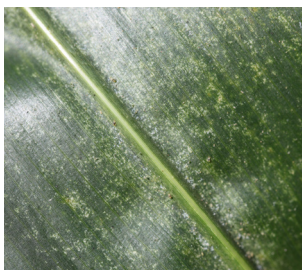
When to scout: Infestations usually begin on the lower portions of the plants. Observe randomly selected leaves from the lower canopy. Stippling on the upper surface and webbing on the lower surface indicate the presence of spider mites. Miticide applications should prevent spider mite infestations from reaching the ear leaf.

Damage: Spider mites damage corn leaves by removing plant sap, resulting in leaf drying, stalk breakage, and kernel shrinking. Damaged leaves become yellowish and stippled on the upper surface and grayish due to webbing on the undersurface.

Characteristics: Adult spider mites are about 0.06 inch long, have four pairs of legs, are greenish to pink or cream colored, and have various sized black spots on the body.



Twospotted spider mite



Leaf discoloration from mite injury



Banks grass mite

Stem borers

Latin name: Sugarcane borer *Diatraea saccharalis* (F.); Southwestern corn borer *Diatraea grandiosella* Dyar; European corn borer *Ostrinia nubilalis* (Hübner)

When to scout: The sugarcane borer, southwestern corn borer, and European corn borer can infest corn in Louisiana. Scouting should focus on late planted non-Bt corn fields. Inspect 10-25 consecutive plants in each of several areas of a field. Insecticide applications can be justified with 5 percent infested plants before tasseling and 10 percent infested plants afterward.

Damage: Young larvae feed on leaves giving them “window pane” appearances. Half-grown larvae bore into the stalks or into the ears through the shanks. Borer damage during whorl stage can cause “dead heart,” while stalk tunneling during the reproductive stages can cause plants to lodge.

Characteristics: Mature stem borer larvae are about 1 inch long with varied color spots on the head and body depending on the species. Adults are small moths having a wingspan of 3/4 to 1.5 inches. Eggs of the three species look like fish scales and overlap in masses.



Sugarcane borer



Southwestern corn borer



European corn borer

Fire ants

Latin name: *Solenopsis invicta* Buren

When to scout: Soon after planting, look for poor stands, hollow seeds and fire ant activity near the seed furrow. Preventive management can be accomplished with insecticide-treated seed.

Damage: Fire ants can feed on dry and germinating sorghum seed, as well as on seedlings, resulting in plant death. Damage is more likely in reduced tillage fields, in heavy soils, and under dry conditions.

Characteristics: Fire ants are red to brown ants with a pedicel (waist) having 2 segments. Wingless workers measure 1/8 to 1/4 inch.



Chinch bug

Latin name: *Blissus leucopterus leucopterus* (Say)

When to scout: Grain sorghum fields should be scouted carefully during early season to detect chinch bugs before severe damage symptoms appear. Begin scouting soon after plant emergence. For seedlings, two or more bugs on 20 percent or more plants justify insecticide treatment.

Damage: Chinch bugs damage grain sorghum by sucking out plant sap with their beaks. This often causes reddening in areas of the stem and leaves where feeding is intense. If feeding continues, plants will eventually wilt and become stunted compared to neighboring plants that are not infested.

Characteristics: Chinch bugs are small true bugs, approximately 1/6 to 1/5 inch long. Their body is generally black with white front wings that have a black spot near the middle of each outer margin. When viewed from above, adults appear to have a white X or a white hourglass on the back. Nymphs are smaller with a white band on the back.



Adults and nymphs



Adult

Cutworms

Latin name: Black cutworm, *Agrotis ipsilon* (Hufnagel); Granulate cutworm, *Feltia subterranean* (F.); Variegated cutworm, *Peridroma saucia* (Hubner)

When to scout: Cutworms are nocturnal and not likely to be seen during the day. Look for areas that sustain stand loss. This will often be in low-lying or previously flooded areas of the field. In addition, fields with vegetation are likely to be infested. Damaged seedlings will be cut off near the soil line. Older seedlings may be cut, or individual leaves may be cut from the plant. Treat when injury reduces stand below optimum plant population.

Damage: In cooler weather, larvae will be at or near the soil surface and will cut plants off at the soil line. In warmer weather, larvae can be found lower in the soil boring into small plants. This feeding often results in wilting or death of the plant.

Characteristics: Black cutworms are gray to brown and appear greasy with a dark brown head capsule. Granulate cutworms are gray and appear dusty with a dark brown head capsule. Variegated cutworms are smooth-skinned larvae that are pale gray or light brown mottled with dark brown.



Aphids

Latin name: Corn leaf aphid, *Rhopalosiphum maidis* (Fitch); Greenbug, *Schizaphis graminum* (Rondani); Yellow sugarcane aphid, *Sipha flava* (Forbes)

When to scout: Corn leaf aphids, yellow sugarcane aphids, and greenbugs can infest sorghum. Corn leaf aphid and yellow sugarcane aphid infestations rarely justify treatment. Therefore, there is little need to scout specifically for these pests alone. Greenbug infestations are rare but can pose a serious threat and scouting should be conducted throughout the growing season.

Damage: On seedlings, corn leaf aphids may be found feeding in the whorl. Feeding may cause plants to turn yellow or reddish. Yellow sugarcane aphid feeding may result in a purplish discoloration on seedling plants and a yellowish or chlorotic discoloration on older plants. Greenbug feeding can cause yellowing in seedlings and older plants with plant death possible under heavy feeding.

Characteristics: All aphids affecting Louisiana sorghum are similar in size and shape. They typically are about the size of a BB and pear-shaped. Corn leaf aphids are dark olive to bluish green with a purplish area around cornicles (tail pipes). Greenbugs have a yellow-green head and upper thorax with a light to medium green abdomen. Yellow sugarcane aphids are bright yellow.



Corn leaf aphid



Greenbug



Yellow sugarcane aphid

Sugarcane aphid

Latin name: *Melanaphis sacchari* (Zehntner)

When to scout: Sugarcane aphids can infest sorghum from emergence to harvest. Routine scouting should be initiated at early boot stage and continued until harvest. Foliar insecticide applications should be initiated when grain sorghum reaches boot to milk stage and aphids number 50 aphids per leaf on 20 percent of the plants in a field.

Damage: Injury to seedlings can kill plants and reduce stand early in the growing season. Injury to pre-boot sorghum reduces seed numbers and, under extreme aphid pressure, will sterilize seed heads. Injury during boot to milk stage plants results in inconsistent head emergence and further exacerbates sorghum midge issues. Injury of soft-to-hard dough stage sorghum may result in yield losses, but the most significant damage occurs as a reduction in grain test weight.

Characteristics: Sugarcane aphids are very small, pale yellow, gray, or tan soft-bodied insects. The cornicles (tail pipes), feet, and antennae are black.



Winged adult and wingless adults and nymphs



Heavy infestations are common

Corn earworm

Latin name: *Helicoverpa zea* (Boddie)

When to scout: After sorghum begins to bloom, sample 10-20 randomly selected heads across a field once or twice a week. Vigorously shake each head in a bucket or sweep net and count the number of worms per head. Control with an insecticide is justified until the hard dough stage when one worm or more per head is found.

Damage: Corn earworms are mainly a pest of grain sorghum during seed head development. Young larvae feed on the flowering parts of heads and often hollow out seeds. Larger larvae completely destroy developing seeds. Corn earworms can infest sorghum in the whorl stage, but feeding is rarely damaging.

Characteristics: Fully developed corn earworm larvae are about 1.5 inches long and vary in color from pale green or pinkish to brown. Adults are light tan in color and about 1.25 inches long. Eggs are white when laid but become dark before hatching.



Fall armyworm

Latin name: *Spodoptera frugiperda* (J.E. Smith)

When to scout: Insecticide control of fall armyworm during the whorl stage of grain sorghum is seldom justified in Louisiana. Inspect field once or twice a week after sorghum begins to bloom. Vigorously shake each head in a bucket or sweep net and count the number of caterpillar per head. Control with an insecticide is justified until the hard dough stage when one caterpillar or more per head is found.

Damage: Larvae cause damage by consuming foliage, growth points, and heads of grain sorghum. Feeding during the whorl stage can cause large irregular holes in leaves as they unroll from the whorl. After sorghum begins to bloom, larvae feed on developing grain.

Characteristics: Fall armyworm larvae vary from light tan to black with three light yellow stripes on the back and a wide dark stripe on each side. The front head of the mature larva is marked with a white inverted "Y." The adult has a wingspan of about 1.5 inches. Eggs are small and laid in a group. The female often produces a layer of grayish scales on the egg mass.



Sorghum webworm

Latin name: *Nola sorghiella* (Riley)

When to scout: Sorghum webworm populations are usually greater in the late-planted sorghum. After sorghum begins to bloom, sample 10-20 randomly selected heads across a field once or twice a week. Vigorously shake each head in a bucket or sweep net and count the number of caterpillars per head. Control with an insecticide is justified until the hard dough stage when four caterpillars or more per head are found.

Damage: Larvae feed on flowers and developing seeds and often suspend themselves by spinning a fine silken strand. Fine webbing can be seen when webworm populations are high.

Characteristics: Mature sorghum webworms are about 1/2 inch long. Worms are flattened, yellow-greenish with four lengthwise dark stripes and are covered with hairs resembling a woolly appearance.



Sorghum midge

Latin name: *Stenodiplosis sorghicola*
(Coquillett)

When to scout: Sorghum fields are susceptible to the sorghum midge only when the plants are flowering. Flowering sorghum is recognized by the presence of fresh, yellow pollen on the sorghum head. Individual sorghum plants usually flower over three or four days, but sorghum fields can have plants in flower for several days to weeks, depending on field uniformity and environmental conditions that determine plant development. At 25-30 percent bloom, treat for one or more midge per head. Additional treatments at 5- to 7-day intervals may be needed.

Damage: Damage from the sorghum midge is not apparent until seed heads mature. Sorghum heads heavily damaged by the sorghum midge are called "blasted" heads and have brown areas where no seeds have developed.

Characteristics: Sorghum midges are 1/16 inch long, fragile-looking, orange-red flies, with a yellow head, brown antennae and legs, and gray membranous wings.



Stem borers

Latin name: Sugarcane borer, *Diatraea saccharalis* (F.); Mexican rice borer, *Eoreuma loftini* (Dyar)

When to scout: The sugarcane borer is a common species whereas the Mexican rice borer is a recently established species in Louisiana. Pheromone traps are available for monitoring Mexican rice borer adults. In field scouting, check leaf damage or larval entry holes in the leaf sheaths. Suspected stalks can be split to look for the larvae. If more than 20 percent plants are injured, insecticides may be applied before larvae bore into the stalks.

Damage: Young larvae feed on leaves and leaf sheaths. Larger larvae tunnel into the stalks causing reduced grain fill, dead seed heads, and increased stalk lodging. Borer-damaged plants are also more susceptible to stalk rot disease.

Characteristics: Mature stem borers are about 1 inch long. Sugarcane borers have brown spot on the body whereas Mexican rice borers have four parallel purple-red stripes along their dorsal side. Moths have a wingspan of 3/4 to 1.5 inches.



Sugarcane borer



Mexican rice borer

A close-up photograph of a corn plant stem. The stem is green with several brown, elongated lesions or spots, likely from a fungal disease. The background is blurred, showing other corn plants and a clear blue sky.

CORN DISEASES

www.LSUAgCenter.com

Seed Rot, Seedling Blight, and Damping-off

Pathogen: *Pythium spp.*, *Fusarium spp.*, and many others

Symptoms and occurrence:

Seed rot, seedling blight, and/or damping-off may occur in years when planting conditions are not ideal with cool, wet weather prevailing soon after planting. Isolated areas of the field, particularly those that are poorly drained, will show reduced emergence, stand, and plant vigor. Diseased seedlings may be observed with considerably slowed plant growth, and seedling death may be observed in some cases.

Management options: The best management practice for seedling disease is to plant during the recommended time frame. Make sure weather conditions will be favorable after planting, and improve drainage in areas with a history of problems. Some fungicide seed treatments may result in improved stand and vigor.



Goss's Bacterial Wilt and Leaf Blight

Pathogen: *Clavibacter michiganensis* subsp. *nebraskensis*

Symptoms and occurrence:

Goss's wilt is a bacterial disease that may appear in Louisiana corn causing stunting, stalk rot, wilting, and foliar blight. Vascular tissue of infected stalks may be discolored orange. Affected leaves will have a water-soaked appearance followed by necrosis with diagnostic "freckles," or specks, appearing within lesions easily visible when backlit by the sun. Bacterial ooze may be present on the leaves drying with the dew resulting in a shiny appearance. The bacterium may be spread by infected seed, rain, wind, or equipment.



Conditions for development: Hybrid resistance is the most effective management practice followed by planting disease-free seed. If Goss's wilt occurs, destroy the crop debris and rotate to a non-host for a minimum of one cropping season. Avoid spread of debris by equipment to other fields.

Holcus Spot

Pathogen: *Pseudomonas syringae* pv. *syringae*

Symptoms and occurrence:

Holcus spot is a bacterial disease that occurs early during the season and is usually not of economic importance. Symptoms of the disease mimic paraquat drift (see page 82) and consist of circular to oval spots ranging up to 10 mm in diameter. Initial infections appear as water-soaked lesions that later turn white. The spots are often observed a few days after a thunderstorm.

Management

options: Holcus spot has no management recommendations because the disease is of minor importance. Paraquat drift, however, can be ruled out using a correct diagnosis.



Southern Corn Leaf Blight

Pathogen: *Bipolaris maydis* (*Cochliobolus heterostrophus*)

Symptoms and occurrence: Southern corn leaf blight is a foliar disease of corn evidenced by longitudinal lesions measuring 2-6 x 3-22 mm that may be limited by leaf veins. Symptoms usually occur in the lower portion of the canopy first. The lesions associated with this disease are much smaller than those of northern corn leaf blight, and warm, humid conditions favor development. The pathogen also may overwinter in plant debris.

Management options: All corn hybrids are resistant to the most virulent race (T) of this pathogen. If this disease is encountered in Louisiana, it is most likely that a much less virulent race "O" of the fungus is present, and treatment with fungicides will be unnecessary. Debris management with tillage or crop rotation may reduce incidence of this disease.



Northern Corn Leaf Blight

Pathogen: *Exserohilum turcicum* (*Setosphaeria turcica*)

Symptoms and occurrence: Northern corn leaf blight (NCLB) is foliar disease of corn evidenced by large, cigar-shaped lesions measuring 3-15 cm long. Lesions appear as water-soaked at first, later turning tan with black-colored fungal sporulation within the lesions. Multiple lesions may occur on a single leaf. If lesions happen to occur on the mid-rib of the corn leaf, the entire leaf past the point of infection may die due to loss of vascular and structural integrity. Spores of the fungus are airborne, and may be spread by wind, rain, insects, equipment, etc. The fungus also may overwinter in corn debris and be more of a problem in areas where continuous corn is grown in a minimum tillage program.

Management options: Corn hybrids are available that are resistant to NCLB. If infection occurs in a susceptible hybrid prior to or at tasseling, fungicide treatment may be necessary. Fungicide efficacy information is limited; however, some studies indicate that fungicides may slow disease development. Debris management with tillage or crop rotation may reduce incidence of this disease.



Gray Leaf Spot

Pathogen: *Cercospora zeae-maydis*

Symptoms and occurrence: Gray leaf spot is a foliar disease of corn caused by a fungus, and symptoms manifest as long (1-6 cm), skinny (2-4 mm), parallel lesions on corn leaves. The undersides of lesions will appear gray. These are spores produced by the fungus, and may cause more infections if spread by dew, rain, wind, insects, equipment, etc. Long dew periods, fog, or cloudy weather may result in severe epidemics.

Management options: Tillage and/or crop rotation may reduce disease incidence as the pathogen overwinters in corn debris. Resistant hybrids may be available, particularly those derived from southern or tropical germplasm. Fungicides may be effective and provide economic return under severe infections.



Crazy Top

Pathogen: *Sclerophthora macrospora*

Symptoms and occurrence: Crazy top is a disease caused by a “water-loving” fungus during periods of prolonged flooding early during the growing season. Symptoms usually will not be evident until tasseling when abnormal growth is obvious. Excessive tillering may occur, and leaves may appear leathery, rolled, and/or twisted. The most obvious symptom is the deformation of the tassel, which is transformed by the pathogen into a strange, leafy structure.



Management options: Improving drainage or avoiding low areas will reduce the incidence and severity. Significant losses due to crazy top will usually only be realized in small isolated areas.

Common Smut

Pathogen: *Ustilago maydis*

Symptoms and occurrence: Common smut is a fungal disease that may affect all above-ground parts of corn plants. Injury to actively growing plants allows for infection by the pathogen. Galls produced by the fungus are easily recognized, particularly when infected kernels have been transformed into fungal fruiting structures. The centers of these fruiting bodies will be filled with dark-colored spores that are released as the structures mature.

Management options: Most corn hybrids are somewhat resistant to smut, and the disease is considered insignificant in Louisiana.



Common Rust

Pathogen: *Puccinia sorghi*

Symptoms and occurrence: Common rust is usually a minor problem in Louisiana corn occurring during the early growing season. The disease prefers cooler weather compared to that of southern rust. Pustules are evident on the upper and lower surfaces of the leaves and may exhibit a linear pattern if infection occurs in the whorl. Cinnamon brown to red spores are produced within the pustules. Severe infections may result in significant leaf area losses.

Management options: Hybrids are available with resistance to common rust. If fungicide applications are warranted, many options are available for management.



Southern Rust

Pathogen: *Puccinia polysora*

Symptoms and occurrence:

Southern rust can be a major problem in Louisiana corn, particularly if the disease is evident early (tasseling) during the growing season. Pustules will appear on mainly the upper surfaces of leaves beginning low in the canopy then progressing upward. Pustules produce copious amounts of cinnamon-brown to orange spores that will readily cause new infections. In severe cases pustules will appear on leaf sheaths and ear husks. Southern rust is favored by hot, humid weather with frequent rainfall events, and under these conditions, may progress very quickly.

Management options: Hybrid resistance is currently not available in commercial hybrids in Louisiana. Fungicide applications may be warranted if the disease is evident prior to early dough stage. If southern rust develops later in the season, fungicide applications must be considered on a field-by-field basis taking into account disease severity, stage of the crop, prevailing environmental conditions, and potential economic benefit.



Stalk Rots

Pathogen: *Gibberella* spp., *Fusarium* spp., *Diplodia* spp., *Colletotrichum graminicola* (Anthracnose)

Symptoms and occurrence: Corn stalks may be affected by several fungal species, and symptoms are usually similar among pathogens. Plant wilting, disintegrating pith tissue, external discoloration, and lodging are common symptoms of stalk rots. *Gibberella* stalk rot is identified by the reddish color produced within the stalk and black perithecia. *Diplodia* is distinguished by dark-colored pycnidia on the rind tissue near the lower portion of stalks. Anthracnose is distinguished by the shiny black discoloration on the outside of the stalk during late season. *Fusarium* stalk rot may not be distinguishable compared to those mentioned previously.

Management options: Most breeding programs have utilized germplasm resistant to most stalk rots; therefore, most hybrids have some resistance to most stalk rots. Proper nutrient management, environmental stress reduction, and timely harvest may reduce harmful effects of stalk rots. Management of stalk boring insects also may reduce incidence of stalk rots.



Ear and Kernel Rots

Pathogen: *Aspergillus*, *Diplodia*, *Fusarium*, *Gibberella*, and other spp.

Symptoms and occurrence: Many of the same pathogens that cause stalk rots may cause ear and kernel rots, which are usually not noticed until late during the growing season. *Aspergillus* infections usually appear on a few kernels and have a characteristic green appearance. *Diplodia* ear rot usually encompasses the entire ear displaying large amounts of whitish to tan fungal growth. *Fusarium* ear rot will have a whitish to pink fungal growth and/or a starburst growth pattern on kernels. *Gibberella* ear rot is also known as red rot because of the reddish growth beginning at the tip of the ear and progressing downward. Many of these fungal species produce mycotoxins, which may be harmful to humans and livestock.

Management options: Hybrids resistant to *Aspergillus*, *Fusarium*, and *Gibberella* ear rots may be available. Crop rotation or tillage may reduce incidence of *Diplodia* ear rot. Managing insect pests may reduce the incidence of *Aspergillus* and *Fusarium*. Proper nutrient management, stress reduction, and timely planting may reduce the chances of encountering ear rots.



GRAIN SORGHUM DISEASES

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Corn Leaf Blight

Pathogen: *Exserohilum turcicum* (*Setosphaeria turcica*)

Symptoms and occurrence: Corn leaf blight of sorghum is a foliar disease caused by the same pathogen that causes Northern corn leaf blight (NCLB) in corn (pg. 62). Symptoms appear as large, cigar-shaped lesions measuring 3-15 cm long and up to 12 mm wide beginning in the lower canopy and progressing upward. Lesions appear as water-soaked at first, later turning tan with black fungal sporulation within the lesions. Multiple lesions may occur on a single leaf, and morphology may vary among hybrids. If infections occur prior to heading, significant losses may occur. Spores of the fungus are airborne, and may be spread by wind, rain, insects, equipment, etc. The fungus also may overwinter in debris, and alternative hosts include sudangrass, johnsongrass, and gamagrass.

Management options: Grain sorghum hybrids are available that are resistant to corn leaf blight. Fungicide efficacy information is limited; however, some studies indicate that fungicides may slow disease development but may not provide economic returns. Debris management with tillage or crop rotation may reduce incidence of this disease.



Anthracnose Leaf Blight

Pathogen: *Colletotrichum sublineolum*

Symptoms and occurrence:

Anthracnose leaf blight is a fungal disease causing variable foliar circular, oval, or elongated lesions about 5 mm in diameter (up to 20 mm) that later may coalesce. Lesion centers are tan to brown and may have gray to black fruiting bodies visible with a hand lens, while margins range in color from yellow to red to purple to black depending on the hybrid. Symptoms will vary depending on the hybrid. Disease epidemics may begin about a month after planting continuing throughout the remainder of the growing season, and hot, humid weather is conducive for disease development. Anthracnose may affect panicles and, subsequently, grain. Stalks also may be affected, which may or may not be related to foliar infection.



Management options: Tillage and/or crop rotation may reduce disease incidence as the pathogen overwinters in sorghum debris. Resistant hybrids may be available; however, hybrids listed as resistant to foliar anthracnose may not be resistant the stalk and/or panicle phases. Hybrids confirmed resistant to anthracnose may be short-lived because the pathogen may adapt to overcome the resistance. Fungicides may be effective on anthracnose; however, efficacy information is limited.

Anthracnose Stalk Rot

Pathogen: *Colletotrichum sublineolum*

Symptoms and occurrence: Anthracnose may affect leaves, panicles, and stalks of grain sorghum, and the relationship among these phases is not well understood. Plants exhibiting symptoms of foliar anthracnose may later develop the stalk phase. In drier areas where foliar anthracnose is unusual, the stalk/peduncle phase of the disease may manifest, and even cause problems with lodging late during the growing season.

Management options: The utilization of resistant hybrids, if available, is the best way to manage stalk anthracnose. Also, see management options of foliar anthracnose (pg. 72).



Zonate Leaf Spot

Pathogen: *Gloeocercospora sorghi*

Symptoms and occurrence: Zonate leaf spot is a foliar disease caused by a fungus during periods of wet weather at any growth stage. The disease is easily identified by semicircular, alternating bands of reddish and tan tissue as a result of the infection. Lesions may range in size from 1 cm to coverage of the entire leaf width. Pinkish sporulation of the pathogen may be present, and severe infections may cause significant leaf area losses resulting in yield reduction.

Management options: Crop debris management or rotation may reduce inoculum levels. Hybrid resistance to this pathogen is largely unknown. Fungicide efficacy information is limited.



Fusarium Root and Stalk Rot

Pathogen: *Fusarium* spp.

Symptoms and occurrence:

Many different *Fusarium* species may cause root and stalk rots in grain sorghum. Losses may be severe in localized areas. Symptoms are evident on the outside or inside of stalks with reddish to purple lesions of varying sizes. The most obvious symptoms will be noticed near the base of the plant. The disease will result in wilting, lodging, and premature plant death. Vascular bundles will not be disintegrated within stalks, and grain on affected plants will be smaller than that of healthy plants.

Management options:

Conservation tillage systems may reduce the incidence of *Fusarium* stalk rots. Use hybrids with resistance to lodging, and conduct harvest in a timely manner to minimize losses. Providing adequate moisture, if possible, during flowering and grain fill may reduce disease severity. Proper plant population may reduce losses due to *Fusarium* stalk rot.



Charcoal Rot

Pathogen: *Macrophomina phaseolina*

Symptoms and occurrence: Charcoal rot is a fungal stalk rot commonly found in areas where hot and dry conditions have prevailed throughout the growing season. Drought stress during grain fill predisposes grain sorghum plants to infection by the pathogen. Stalks when split at the base may be in various stages of disintegration, and when examined closely, reproductive structures of the fungus within vascular tissues will resemble pepper grains. Charcoal rot may cause significant losses due to lodging, and may occur within the same areas from year to year. The pathogen has a vast host range, with many Louisiana crops susceptible.

Management options: Proper seeding rate will allow for robust stalks lessening the likelihood of lodging. Proper nutrition avoiding excessive nitrogen and/or low potassium may reduce charcoal rot incidence. Irrigation or rain during grain fill will reduce charcoal rot incidence. Drought-tolerant hybrids may be better suited to tolerate charcoal rot, and lodging resistance is a desirable characteristic.



Grain Molds

Pathogen: *Fusarium*, *Curvularia*, *Colletotrichum*, *Alternaria*, *Phoma*, and many other spp.

Symptoms and occurrence:

Many different species of fungi may infect grain sorghum after heading. Sorghum hybrids with white grain are more susceptible than others, and affected kernels may be any color depending on which species of fungi is present. Grain molds will usually occur when grain sorghum is maturing during warm and wet conditions. Losses caused by grain molds may be severe under optimal conditions, and a number of mycotoxins are associated with the fungi that may make the grain unmarketable.

Management options:

Hybrids that are high in tannins and colored may have some resistance to grain mold. Timely harvest may reduce the incidence of grain molds.



Rough Leaf Spot

Pathogen: *Ascochyta sorghina*

Symptoms and occurrence:

Rough leaf spot occurs in areas where humid conditions prevail and is easily identified during later stages of development by running a finger across lesions, which will feel like sandpaper. Raised, black reproductive structures of the fungus will be evident within oblong lesions ranging in size from 1-3 mm wide by 1-4 mm long. Lesion color may be variable depending on the hybrid and may coalesce resulting in large necrotic areas. Rough leaf spot may be confused with corn leaf blight (pg. 71). The fungus is spread by rain and may overwinter in crop debris.

Management options:

Management of rough leaf spot usually is not necessary because losses due to this disease are negligible.





OTHER Issues

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Rootless Corn Syndrome

Occurrence: Rootless corn phenomenon is currently attributed to excessive amounts of rainfall that erodes the soil near the plant stem's base and/or strong winds breaking the upper roots. Intense rainfall and flooding events can compact the soil surface and prevent the establishment of the nodal root system penetrating the soil. Other situations where rootless corn syndrome can occur are under hot and dry conditions on the soil surface, planting too shallow (requiring less soil erosion from the seedbed to expose the stem and rooting nodes), and loose or cloddy soils that lose moisture very quickly. These conditions hinder the establishment of a consistent and strong nodal root system.

Symptomology: Field corn plants (V2-V5 stages) that appear to be lodging at the soil line with no indication of pest or herbicide injury to the stalk or roots are a common observation associated with this phenomenon. Also, these plants exhibit poor nodal root development in dry soils or a dry soil surface. Existing nodal roots may be stubby and not



anchored to the soil. Roots may not have formed below the soil line, and the plant crown may appear to be at or above the soil surface. Without an adequate root system, affected plants may lodge, wilt or even die. Depending on field conditions, the pattern of injury may include adjacent plants within the same row or large isolated across a field. Plants that do not lodge may still be injured and demonstrate below optimum root development. These symptoms may follow environmental conditions of intense rainfall and wind.

Management: The important thing to remember is that field corn roots will not develop in dry soil. Root will not develop without some moisture. In some instances, plants may recover if rainfall or irrigation softens the soil surface that will promote nodal root development. If lodging is not severe, row cultivation to move moist soil around bases of plant stalks may encourage root development. Irrigation after cultivation may improve soil moisture and improve root development.



Herbicide Injury in Field Corn and Grain Sorghum

Occurrence: Incorrect herbicide selection, excessive product rates, poor application techniques, and non-target drift from adjacent fields can result in abiotic injury to field corn and grain sorghum. Depending on the specific herbicide treatment, yield losses can range from no effect to complete loss of the crop. Nearly all field corn varieties planted in Louisiana are resistant to glyphosate, but presently none of the grain sorghum varieties tolerate this herbicide without some yield losses. Additional herbicide technologies are becoming available and could affect field corn and grain sorghum plant development and yield unless varieties tolerant to these products are planted.

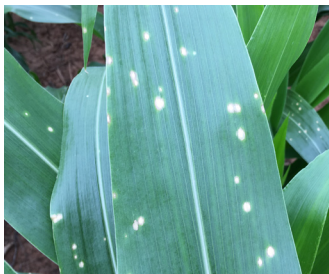
Symptomology: Frequently herbicide phytotoxicity symptoms can be confused with diseases or nutrient



Paraquat drift symptoms



Paraquat drift symptoms



Paraquat drift symptoms

deficiencies in plants, such as discolored leaves or veins, necrosis, stalk dieback, malformed corn ears, and inconsistent grain fill. If injury from a herbicide is suspected, the progression of symptoms is critical in accurate diagnosis. Trained specialists may confirm the possibility of herbicide injury, but positive confirmation of herbicide injury requires laboratory testing of living plant tissue and/or the soil while the chemical is still present at detectable levels.

Management: Crop management for herbicide injury will depend on the severity of the damage and time of occurrence. In some instances, re-planting with the same or another crop is possible if damage occurred on seedlings during the early season.



Clethodim injury



Fomesafen injury

Nutrient Deficiencies in Field Corn and Grain Sorghum

Occurrence: Field corn and grain sorghum need a combination of nutrients in the correct proportions to produce optimum yields of high quality grain. When the soil is deficient in one or more plant nutrients, plants typically show symptoms of being unhealthy. Farmers should test their soils at least every three years (in some cases every year) to determine what common nutrient levels are in fields and to have some estimate of fertilizer needs for each crop.

Symptomology: Many nutrient deficiencies in plants may look similar depending on the severity of the problem. General symptoms of nutrient deficiency include poor

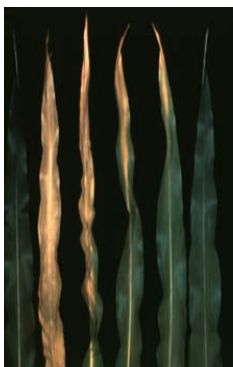


Zinc sufficiency

Zinc deficiency

plant growth (stunting, small corn ears or short panicles); distorted leaves; and discolored (yellow, red, purple, or burnt leaves). In some instances, the location of symptoms on a plant (such as older leaves vs. younger leaves), period of plant growth (seedling vs. reproductive plant), or time of season (cold vs. hot environment) can be strong indicators for a deficiency of a specific nutrient. Other crop yield-limiting factors, such as moisture stress, disease infection, or insect injury that may occurs simultaneously with a nutrient deficiency, may influence the actual symptoms that occur. Sampling plant tissue from affected and normal plants can aid in diagnosis of the actual problem.

Management: Crop management for nutrient deficiencies will depend on observation timing. In some instances, some of the problem may be corrected with a soil or plant application of the yield-limiting nutrient. However, if symptoms are evident, some potential yield loss may have already occurred and may not be recoverable. Fertilizing the soil to a sufficient level for optimum yields with applications prior to the crop actually needing nutrients serves as a preventive strategy and usually will be the most successful.



Nitrogen deficiency

Environmental Effects on Field Corn and Grain Sorghum

Occurrence: Moisture stress (drought, flooding, erratic rainfall events), and excessive temperatures (freezes or extreme heat) usually occur in some field corn and grain sorghum fields across Louisiana each year. The absence of moisture sufficient for optimum plant development slows all plant physiological process and reduces transport of nutrients to plant roots. Erratic rainfall can serve to maintain plant survivorship, but not allow the crop to reach optimum performance. Intense

or extended rainfall that flood fields reduce the availability of oxygen and root growth. Plants in flooded environments are frequently starved for some nutrients, further compounding the problem due to damaged roots and field losses of nutrients. Field corn and grain sorghum may be planted during the early spring, and their seedlings are usually susceptible to low temperature environments, occasionally resulting in freeze damage. During the later season, high temperatures cause greater moisture needs in crops. In some instances, excessive heat may cause poor pollination and incomplete grain fill.



No or poor pollination

Symptomology: Environmental stresses usually are the result of a major change in the local field environment, which sometimes makes a correct diagnosis much easier than with

other yield limiting issues. Producers are aware of the previous or ongoing weather events that can cause environmental events to negatively influence plant growth and crop yields. Accurate identification of the problem can usually be supported with recent weather information for



Corn seedling damaged by frost at the V2 stage.

the affected fields. Dead or dying plants, seedling loss, stunted or wilted plants can all be common symptoms of environmental stresses. Unhealthy plants are usually more susceptible to injury from herbicides, diseases and insects. Even if the secondary problems can be managed, the effects of environmental stresses may continue to limit yield potential.

Management: Eliminating or reducing the stresses in the environment with cultural crop production strategies are the only means of correcting these problems. Improving field drainage, sufficient irrigation timing, delaying crop seeding (after the probability of freeze damage has decreased), and selecting varieties with drought or heat tolerance are examples of management strategies. Unfortunately, environmental stresses can be widespread, not easily corrected within the same production season, and cause severely limited yields.

To find more details about corn and feed grain production, visit these websites from the LSU AgCenter and others:

Corn Web Portal

www.LSUAgCenter.com/corn

Corn Weeds

www.LSUAgCenter.com/cornweeds

Corn Insects

www.LSUAgCenter.com/corninsects

Corn Diseases

www.LSUAgCenter.com/corndiseases

Corn Publications

www.LSUAgCenter.com/cornpubs

Sorghum Web Portal

www.LSUAgCenter.com/sorghum

Sorghum Weeds

www.LSUAgCenter.com/sorghumweeds

Sorghum Insects

www.LSUAgCenter.com/sorghuminsects

Sorghum Diseases

www.LSUAgCenter.com/sorghumdiseases

LSU AgCenter Agents

www.LSUAgCenter.com/agents

National Sorghum Producers

www.sorghumgrowers.com

United Sorghum Checkoff Program

www.sorghumcheckoff.com

National Corn Growers Association

www.ncga.com

For the Louisiana feed grains industry to remain viable, it is essential that producers and consultants be able to identify and manage existing and emerging weed, insect and disease issues.

To meet this need, the Louisiana Soybean and Grain Research and Promotion Board provided support through checkoff funds to develop this pocket field guide.

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Feed Grains: Corn and Sorghum Weed, Insect and Disease Field Guide

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