

# Integrated Pest Management

## IDENTIFYING GRASS SEEDLINGS

Plant Protection Programs  
*College of Agriculture, Food  
and Natural Resources*

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### On the cover

Carolina foxtail and little barley in no-till field;  
Carolina foxtail ligule

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In any integrated pest management program, the first logical step is to recognize the pest. Control measures depend upon accurate identification. Grasses occurring as weeds are difficult to identify in their vegetative stages, particularly in the one- to two-leaf seedling stage of growth. At this stage, you often need to identify the grass to make important management decisions. Many grasses do not flower until late in the growing season, after they have already had an impact on crop yields.

Accurate identification is also important in the early growth stages because smaller grasses are easier to control with conventional management tactics than larger grasses. Smaller grass seedlings are more susceptible to lower dosages of herbicides, and thus greater control can be achieved while minimizing control costs.

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## PRINCIPLES of WEED IDENTIFICATION

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Several obvious features help you narrow the list of potential species when identifying a grass plant. First, consider the life cycle. Because some grasses are not present at certain times of the year, these can quickly be eliminated from the list. For example, you would not expect to encounter a



Figure 1. Yellow foxtail has flat stems.



Figure 2. Carefully pull back the blade to reveal the collar region.

warm-season annual grass, such as giant foxtail, in March. Likewise, winter annual grasses, such as downy brome, die back with the onset of late spring and early summer temperatures and are not present during the summer months.

The shape of the stem is another feature that is easy to determine. Most grasses have round stems, but several others have distinctly flat stems. Knowing the several common grasses that have flattened stems, you can quickly reduce the list of potential species. Some of the common grasses with flattened stems are barnyardgrass, goosegrass, orchardgrass and yellow foxtail (Figure 1).

If the stem has a triangular shape, the plant is most likely a sedge, not a true grass at all. This is an important determination because management for a grass is much different than management for a sedge. Rate and herbicide selection for control of sedges are much different. Some herbicides that are specifically designed to control grasses have no effect on sedges.

Because grasses have subtle distinguishing characteristics, it is especially important to use a hand or pocket lens with 10× magnification power. Most identifying characteristics are contained in the collar region. The collar region can be seen by carefully pulling the leaf blade back from the stem (Figure 2).

After pulling back the blade, look for the ligule. The ligule, if present, is a small projection that appears as a membrane or a tuft of hair at the base of the leaf blade (Figures 3–4). The hand lens allows you to view this structure and aids in grass identification.



Figure 3. No ligule.



Figure 4. Membranous ligule.



Figure 5. Auricles clasp around stems.



Figure 6. Densely hairy grass plant.

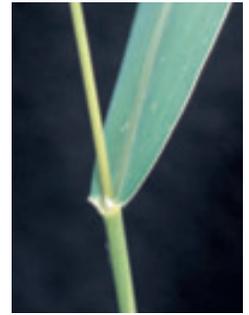


Figure 7. Smooth leaf blade surface.

Some grassy weeds have auricles, small fingerlike structures that appear to clasp around the stem at the collar (Figure 5). Common grasses with auricles that can easily be seen include annual and perennial ryegrass and quackgrass. Like broadleaf weeds, grasses vary in the amount and location of hairs on their surfaces (Figures 6–7).

For example, a key difference between large and smooth crabgrass is that large crabgrass is covered with dense hairs while smooth

crabgrass has few, if any, hairs.

Another example is the difference between Missouri's three most common foxtails. Giant foxtail's upper leaf surface is covered with a dense layer of hair; yellow foxtail has only sparse hairs on the section of the upper leaf blade closest to the main stem; and green foxtail's upper leaf surface is entirely smooth. The ability to recognize these features will help you accurately identify grass species with the identification key (pages 22–23).

## WEED IDENTIFICATION

This publication is designed to assist those in agricultural and horticultural settings to identify grassy weed species. The following photographs and written descriptions will help you compare your samples for positive identification. The photographs help compare characteristics of grass species at immature as well as mature stages of growth. For effective management, positive identification of any pest, including weeds, is paramount.

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## SUMMER ANNUAL GRASSES

### Barnyardgrass (*Echinochloa crus-galli*)

**Description:** Barnyardgrass is a coarse, clump-forming grass with many slightly swollen nodes. It grows stiffly erect or sometimes prostrate with the tips ascending (decumbent), and sometimes branches at its base. The sheath is somewhat flat and smooth. The leaf blades are 3–12 mm wide and smooth, with a prominent white midvein. Auricles and ligules are absent. Some plants may have a few sparse hairs emerging from the collar, while others do not.

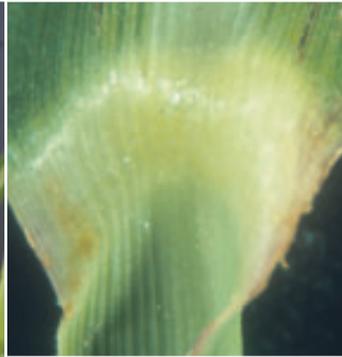
**Habitat:** Barnyardgrass grows best in moist areas such as low areas of cultivated fields. It is present in many settings, including open fields, waste ground, roadsides and lawns, cultivated fields and gardens and along banks of streams and ponds.

**Distribution:** All Missouri counties and much of North America.

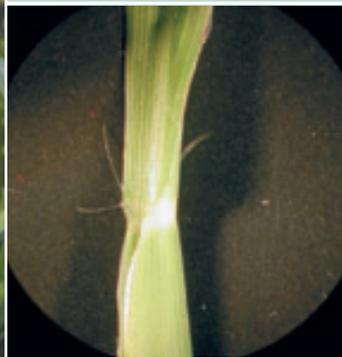
**Similar species:** Several other summer annual grasses, such as shattercane and fall panicum are often confused with this species. However, each possesses a ligule, unlike barnyardgrass.



Mature barnyardgrass.



Lacks ligule and auricles.



Collar region with sparse hair.

## SUMMER ANNUAL GRASSES

### Broadleaf signalgrass (*Brachiaria platyphylla*)

**Description:** Broadleaf signalgrass is a decumbent, spreading grass that will root at its nodes. The leaf sheath and margins are lined with hairs. The ligule is a short ring of hair. The leaf blade is widest at the base and gradually tapers to the apex. Leaf margins near the base often have a crinkled, wavy appearance. Both the upper and lower leaf surfaces are smooth.

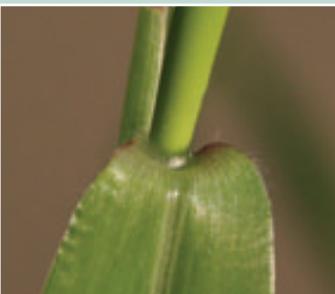
**Habitat:** It is most commonly found in disturbed, open and sandy sites such as crop fields, ditches and roadsides.

**Distribution:** Broadleaf signalgrass is found across the southeastern United States. In Missouri, it is limited primarily to the southeastern and southwestern portions of the state.

**Similar species:** Smooth crabgrass also roots at the nodes but has a large, membranous ligule. Woolly cupgrass has a wide leaf blade at the base that tapers to the apex but is covered with hairs on both upper and lower surfaces.



Broadleaf signalgrass seedling.



Collar region: margins lined with hairs.



Crinkled leaf margin.

## SUMMER ANNUAL GRASSES

### **Crabgrass, large** (*Digitaria sanguinalis*)

**Description:** Large crabgrass has weak stems that result in a decumbent growth habit. It often roots at its lower nodes, which gives it a sprawling appearance. Its stems and leaf surfaces are covered with soft hair. Hairs grow from the stem at a 90-degree angle. The blades are flat and 5–10 mm wide. Auricles are absent, and the ligule is a jagged membrane 0.5–2 mm long.

**Habitat:** Large crabgrass is present in practically all agronomic and landscape settings. It can tolerate diverse soil and moisture conditions.

**Distribution:** Large crabgrass is found throughout Missouri and the United States.

**Similar species:** Large crabgrass is one of three crabgrass species that occur in Missouri. Smooth crabgrass is nearly identical but lacks hair on the leaves and stems.



Mature large crabgrass: decumbent growth habit.



Collar region: ligule is a jagged membrane.



Seedhead.

## SUMMER ANNUAL GRASSES

### **Crabgrass, smooth** (*Digitaria ischaemum*)

**Description:** Smooth crabgrass has weak stems that result in a decumbent growth habit. It often roots at its lower nodes, which gives it a sprawling appearance. Its stems and both leaf surfaces are hairless or have a few sparse hairs. The blades are flat and 5–10 mm wide. Auricles are absent, and the ligule is a jagged membrane 0.5–2 mm long.

**Habitat:** Smooth crabgrass is present in practically all agronomic and landscape settings. It can tolerate a wide range of soil and moisture conditions.

**Distribution:** Smooth crabgrass is found throughout Missouri and the United States.

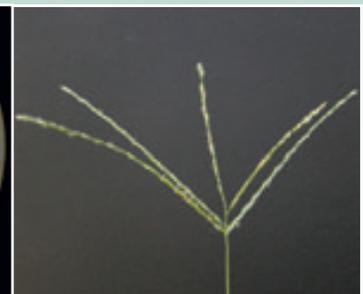
**Similar species:** Smooth crabgrass is one of three crabgrass species that occur in Missouri. Large crabgrass is nearly identical, with the exception of its dense leaf and stem hair.



Mature smooth crabgrass: decumbent growth habit.



Collar region: ligule is a jagged membrane.



Seedhead.

## SUMMER ANNUAL GRASSES

### Fall panicum

(*Panicum dichotomiflorum*)

**Description:** Stems may be erect or bent at the lower nodes and ascending or decumbent. Sheaths and stems may be round and smooth. Blades are flat, smooth and 4–15 mm wide with a prominent white midvein. Auricles are absent, and the ligule is a fringe of hair. Often, the lower leaf surface of the first seedling leaf is covered with hair; however, this characteristic disappears with age.

**Habitat:** Fall panicum is common in cultivated agronomic crops. It may also be found in landscape and noncrop areas.

**Distribution:** Fall panicum is found throughout Missouri and the United States.

**Similar species:** Barnyardgrass also has a similar growth habit but it lacks a ligule. Johnsongrass has a similar growth habit but is a rhizomatous perennial, and its mature ligule is topped with a fringe of hair.



Mature fall panicum.



Collar region: Ligule is a fringe of hair.



Hair on lower surfaces of seedling leaves.

## SUMMER ANNUAL GRASSES

### Foxtail, giant

(*Setaria faberi*)

**Description:** Giant foxtail is an erect-growing grass that reaches a height of about 3 feet. Auricles are absent, and the ligule is a tuft of hair. Sheaths are nearly round, usually smooth, and the blades are short, hairy and 10–15 mm wide with the entire upper surface covered with hair.

**Habitat:** Giant foxtail commonly occurs in cultivated fields, pasture, waste ground, landscapes and any open area with nutrient-rich soil.

**Distribution:** Since its introduction into the United States in 1931, giant foxtail has rapidly spread through the Middle Atlantic states, across Missouri and west to Kansas and Oklahoma.

**Similar species:** Green foxtail and fall panicum also have hairy ligules, but they lack hair on their leaf surfaces. Yellow foxtail has a hairy ligule, but it has only a few sparse, long hairs along the base of the upper leaf surface, and its stems are also flat, unlike those of giant foxtail.



Mature giant foxtail.



Collar region. Hairy ligule.



Giant foxtail seedling.

## SUMMER ANNUAL GRASSES

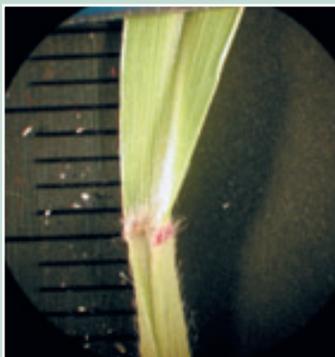
### Foxtail, green (*Setaria viridis*)

**Description:** Green foxtail is an erect-growing grass that reaches a height of 1–2 feet. Auricles are absent, the ligule is a tuft of hair, and sheaths are nearly round and lined with hairs. The blades are hairless with a rough texture and are 4–10 mm wide.

**Habitat:** Green foxtail commonly occurs in cultivated fields, pasture, waste ground, landscapes and any open area with nutrient-rich soil.

**Distribution:** Green foxtail is found throughout Missouri and the United States.

**Similar species:** Giant foxtail also has a hairy ligule, but it is covered with hair on the upper leaf surface. Yellow foxtail has a hairy ligule but only a few sparse, long hairs along the base of the upper leaf surface. The stems of yellow foxtail are flat.



Collar region: hairy ligule.



Mature green foxtail.



Green foxtail seedhead.

## SUMMER ANNUAL GRASSES

### Foxtail, yellow (*Setaria glauca*)

**Description:** Yellow foxtail is a decumbent annual grass that may root at its nodes. Auricles are absent, the ligule is a tuft of hair, and sheaths are distinctly flat with a reddish color. The blades are 5–10 mm wide, a pale, blue-green color and hairless except at their bases, which have long, sparse hairs.

**Habitat:** Yellow foxtail commonly occurs in cultivated fields, pasture, waste ground, landscapes and any open area with nutrient-rich soil.

**Distribution:** Yellow foxtail is found throughout Missouri and across the United States.

**Similar species:** Giant foxtail also has a hairy ligule, but it is covered with hairs on the upper leaf surface. Green foxtail has a hairy ligule, but it lacks hairs along the upper leaf surface. Green foxtail has round stems.



Collar region: hairy ligule and hairs at base of leaves.



Mature yellow foxtail.



Yellow foxtail seedhead.

## SUMMER ANNUAL GRASSES

### Goosegrass (*Eleusine indica*)



Mature goosegrass: flat stems radiate from a central point.

**Description:** Goosegrass is a prostrate-growing grass that usually has radiating stems from a central growing point. Its sheaths are distinctly flat and white, leading some to call this grass “silver crabgrass.” The blades are usually folded, 3–8 mm wide when flat and may contain a few sparse hairs near their base. Auricles are absent, and the ligule is a short membrane. It typically emerges several weeks later than crabgrass species.

**Habitat:** Goosegrass tolerates harsh conditions, including drought and hard, compacted soils and close mowing, especially around walkways and driveways. It is also found in other landscaped areas and cultivated crops.

**Distribution:** Goosegrass occurs throughout Missouri, west to Utah and along the Pacific Coast.

**Similar species:** The crabgrasses have similar growth habits and invasive tendencies. However, the leaves and stems of crabgrass are not flat. Also, the ligule of crabgrass is much longer than that of goosegrass. Orchardgrass has flat leaves and stems, but it has a perennial life cycle and a much larger ligule.



Collar region: short, membranous ligule. Seedhead.

## SUMMER ANNUAL GRASSES

### Japanese stiltgrass (*Microstegium vimineum*) also called *Mary's-grass*



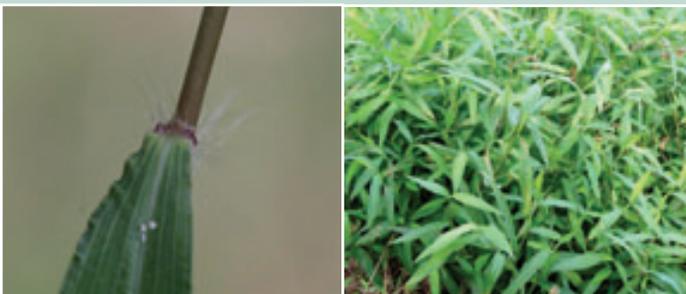
Japanese stiltgrass: asymmetrical leaves with off-center midribs.

**Description:** An invasive annual grass that can root at the node and prefers to grow in shady locations. This grass can reach as much as 3½ feet in height and has asymmetrical leaves that have an off-center, shiny midrib. Leaves are 1–3 inches long, 5–8 mm wide, are without auricles, and have a short (0.5 mm) hairlike ligule that is barely discernable.

**Habitat:** Occurs as a weed of woods, nature trails, pastures, lawns, along roadsides and any area with a dense cover of shade.

**Distribution:** Occurs throughout the eastern United States but currently rare in Missouri.

**Similar species:** The distinctive midrib that does not separate the leaf exactly in half as in other grasses helps to differentiate Japanese stiltgrass from all other species.



Collar region: short, hairy ligule. Mature Japanese stiltgrass.

## SUMMER ANNUAL GRASSES

### **Sandbur, longspine** (*Cenchrus longispinus*)

**Description:** Longspine sandbur is a coarse-textured grass with rough blades. It is off-green in color with leaves that are folded in the bud and compressed sheaths. At times, longspine sandbur will root at its nodes, and it rarely reaches a height greater than 15 inches. The blades are usually smooth, occasionally have a few sparse hairs and are 3–5 mm wide when flat. The ligule is a small tuft of hairs, and a few sparse hairs emerge from the collar.

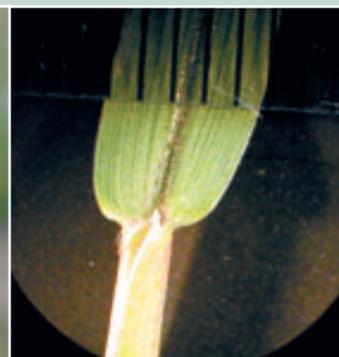
**Habitat:** Longspine sandbur is most commonly encountered on sandy soils.

**Distribution:** Longspine sandbur is found throughout Missouri and the United States except the Pacific Northwest.

**Similar species:** Goosegrass leaves are also folded in the bud, but it has a small, membranous ligule and smooth texture. The ligule of giant foxtail, green foxtail and fall panicum is similar, but those species have leaves that are rolled in the bud.



Longspine sandbur has burl-like fruit.



Collar region: ligule is a small tuft of hairs.



Seedlings.

## SUMMER ANNUAL GRASSES

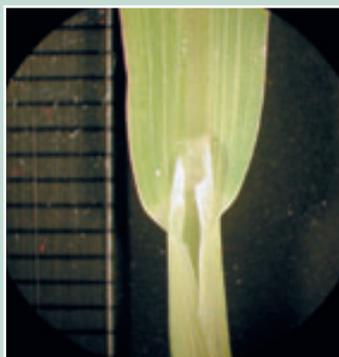
### **Shattercane** (*Sorghum bicolor*)

**Description:** Shattercane hybridizes with cultivated sorghum and johnsongrass, and thus varies in its physical features. The sheaths and stems are round, and the ligule is membranous. Upper and lower leaf surfaces may have hairs, but this is an extremely variable trait. Shattercane is a tall, erect-growing plant that is competitive with agronomic crops, particularly corn and grain sorghum.

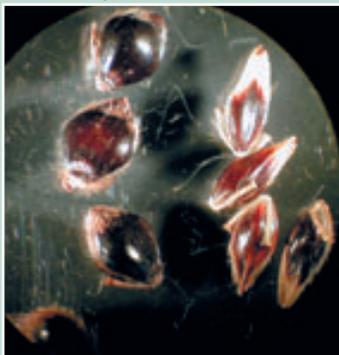
**Habitat:** Shattercane is a serious agronomic weed but is rarely problematic in landscapes.

**Distribution:** In Missouri, shattercane occurs mainly in the southwestern counties and north of the Missouri River. It can be found in much of the United States except the northeastern and Pacific northwestern states.

**Similar species:** Johnsongrass is closely related but has a different life cycle. Johnsongrass is perennial and has stout underground rhizomes, whereas shattercane is an annual and does not produce rhizomes. The seed of shattercane is much larger and rounder than johnsongrass. If seedlings are carefully removed from the soil, the seed may still be attached for identification.



Collar region: round stem, membranous ligule.



Shattercane seeds (left) and johnsongrass seeds (right).



Mature shattercane.

## SUMMER ANNUAL GRASSES

### Stinkgrass

(*Erogrostis cilianensis*)

**Description:** A summer annual grass weed that emits a distinctive odor.

**Habitat:** Stinkgrass is a common grass weed of many agronomic and horticultural crops, gardens, pastures, and hayfields. Leaves are rolled in the bud and are approximately 5–10 mm wide. Leaves are smooth and glossy below, while upper leaf surfaces are rough and may have hairs along the margins. Auricles are absent and the ligule is a fringe of hairs that is usually less than 1 mm long. The seedhead is a triangular panicle that has a grayish green cast. Individual spikelets are gray to silver in color.

**Distribution:** Found throughout the United States.

**Similar species:** Yellow foxtail has a similar ligule and collar region, but the sheaths of yellow foxtail are usually distinctively flat, unlike stinkgrass.



Seedhead: triangular panicle.



Collar region: hairy ligule.



Mature stinkgrass.

## SUMMER ANNUAL GRASSES

### Texas panicum

(*Panicum texanum* or *Urochloa texanum*)

**Description:** Texas panicum is a spreading summer annual with relatively wide leaves that may have an erect growth habit, or it may grow close to the ground with tips ascending (decumbent growth habit). Leaf blades range from 3–11 inches in length and may reach a width of 20 mm. Leaves are covered with short, soft hairs on both surfaces. Auricles are absent and the ligule is membranous and fringed with hairs, from 1–1.8 mm long.

**Habitat:** Occurs primarily as a weed of agronomic crops.

**Distribution:** Found throughout the southeastern United States but occurs only sporadically in the southern third of Missouri.

**Similar species:** Very similar in appearance and growth habit to large crabgrass and broadleaf signalgrass. However, large crabgrass has a tall membranous ligule unlike either of these other species. Broadleaf signalgrass has hairs only along the leaf margins, unlike Texas panicum.



Mature Texas panicum.



Collar region: membranous ligule fringed with hairs.



Seedling.

## SUMMER ANNUAL GRASSES

### Witchgrass

(*Panicum capillare*)

**Description:** Witchgrass is a tufted grass that may grow in a decumbent fashion, or upright, and reaches a height of about 30 inches. The sheaths and stems are round and densely covered with soft, stiff long hairs at a 90-degree angle to the stem and sheath. The blades are also covered with soft hair and are 4–12 mm wide. Auricles are absent, and the ligule is a frings of hairs. At maturity, the plant breaks off and is often referred to as “tumbleweed.”

**Habitat:** Witchgrass tolerates many soil conditions and may be found in pastures, open fields, cultivated fields, waste areas, banks of streams and rights-of-way.

**Distribution:** Witchgrass is common throughout Missouri and much of the United States.

**Similar species:** Wild proso millet is a related species but is not common in Missouri.



Collar region: hairy ligule; stem and sheath covered with hairs.



Seedling.



Mature witchgrass.

## WINTER ANNUAL GRASSES

### Annual bluegrass

(*Poa annua*)

**Description:** Annual bluegrass is a clump-forming grass that sometimes roots at its lower nodes and forms mats. Although it can tolerate close mowing, annual bluegrass can reach 2 feet in height if left unmowed. Sheaths are flat and smooth. Leaf blades are flat, smooth and 2–3 mm wide with a prowlike tip. Auricles are absent, and the ligule is a prominent, rounded to acute membrane.

**Habitat:** Annual bluegrass poses a problem in high-maintenance turfgrass settings. Its seed is a common contaminant of Kentucky bluegrass lawn seed. The white seedheads form quickly at close-mowing heights and disrupt the uniformity of golf course greens. It grows best in rich, moist soils but will tolerate compacted sites.

**Distribution:** Annual bluegrass is scattered nearly throughout the United States. In Missouri, it is less common north of the Missouri River.

**Similar species:** There are approximately 10 *Poa* species present in Missouri; all share some common physical features but vary in their life cycles.



Prowlike tip of blade.



Collar region: prominent, membranous ligule.



Mature annual bluegrass.

## WINTER ANNUAL GRASSES

### **Brome, downy** (*Bromus tectorum*)

**Description:** Downy brome is a tuft-forming, densely hairy winter annual. The leaf blades have a spiraling appearance, 2–6 mm wide and both the upper and lower surfaces are covered with hair. The sheath is round and also covered with hair. Auricles are absent, and the ligule is a prominent membrane.

**Habitat:** Downy brome can be found in many settings but is most problematic as an agronomic weed of wheat.

**Distribution:** Downy brome is an introduced species but is found throughout Missouri and the United States.

**Similar species:** Cheat is also a winter annual that is closely related, but it is not as densely hairy as downy brome and not as common in Missouri.



Mature downy brome.



Seedling: spiraling leaf blades.



Collar region: prominent ligule; leaves densely hairy.

## WINTER ANNUAL GRASSES

### **Carolina foxtail** (*Alopecurus carolinianus*)

**Description:** Carolina foxtail reaches only 4–6 inches in height but has a distinctive, compact foxtail-like seedhead that resembles that of timothy. The leaves are without auricles and have a membranous ligule that is 2–3 mm tall. Leaf blades are only 1–5 mm wide and 2–5 inches long with distinctive veins or ridges.

**Habitat:** Carolina foxtail is a common winter annual grass that favors wet areas in no-till agronomic crops, fallow fields, pastures and roadsides.

**Distribution:** Carolina foxtail is found throughout Missouri.

**Similar species:** This foxtail is not related to the common summer annual foxtails that commonly invade row crops. Little barley and foxtail barley may appear similar, but they grow to taller heights and usually have much larger leaves and smaller ligules than Carolina foxtail.



Mature Carolina foxtail.



Collar region: tall, membranous ligule.



Seedhead.

## WINTER ANNUAL GRASSES

### Cheat

(*Bromus secalinus*)

**Description:** Cheat may grow as an erect or ascending plant up to 3½ feet high. The presence of hair on the plant is variable. Sheaths are round and may be smooth but are sometimes hairy. Blades are 3–9 mm wide, may be smooth or hairy and have a twisted appearance. Auricles are absent, and the ligule is a prominent, ragged membrane.

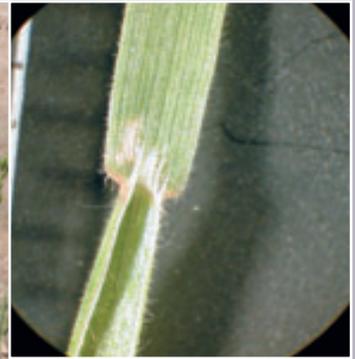
**Habitat:** Cheat occurs on disturbed banks of waterways, rights-of-way, pastures, fallow fields and open, disturbed areas. Cheat can be a serious weed problem in wheat production in Missouri.

**Distribution:** A native of Europe, cheat has adapted to a wide distribution throughout Missouri, the United States and Canada.

**Similar species:** Downy brome is also a winter annual that is closely related, but it is more densely hairy and more common throughout Missouri.



Mature cheat.



Collar region: prominent, ragged ligule.

## WINTER ANNUAL GRASSES

### Little barley

(*Hordeum pusillum*)

**Description:** Little barley has erect stems and grows approximately 2 feet high. The round sheath is smooth or may have short, spreading hairs. Leaf blades are flat, smooth or somewhat rough and 2–5 mm wide. Auricles are absent, and the ligule is a short membrane.

**Habitat:** Little barley grows most often in open and disturbed areas such as crop fields, but it also appears in pastures, fallow fields and rights-of-way.

**Distribution:** Little barley is found throughout much of the United States. In Missouri, it is most commonly encountered north of the Missouri River and in wheat-producing areas.

**Similar species:** Foxtail barley is closely related, but it has a perennial life cycle and can reach slightly greater heights.



Seedhead.



Collar region: short, membranous ligule.



Mature little barley.

## WINTER ANNUAL GRASSES

### Ryegrass, annual or Italian (*Lolium multiflorum*)

**Description:** Annual ryegrass is a winter annual grass that may reach 3 feet in height. Leaves are rolled in the bud with conspicuous clawlike auricles in the collar region. Leaf blades are 2½–8 inches long, 4–10 mm wide when mature, and have a membranous ligule. Leaves usually have a glossy appearance on the lower surfaces, and leaf sheaths are often tinged red at the base. The seedhead is a spike (4–16 inches long) with spikelets that have long awns arranged alternately up the stem.

**Habitat:** Annual ryegrass occurs primarily as a weed of small grains and no-till cropping systems.

**Distribution:** Annual ryegrass occurs primarily in the southern half of Missouri but can occur throughout the United States and is often planted for various purposes.

**Similar species:** Perennial ryegrass is similar but has a perennial growth habit and is generally smaller than annual ryegrass. Tall fescue and quackgrass also have auricles, but these are perennials that occur in the summer, unlike annual ryegrass, which has a winter annual growth habit.



Seedhead: awns arranged alternately.



Collar region: clawlike auricles and membranous ligule.



Annual ryegrass seedling.

## WINTER ANNUAL GRASSES

### Wheat, volunteer (*Triticum aestivum*)

**Description:** Volunteer wheat is a coarse, nonpersistent annual grass. Stems are erect, branch at the base and reach up to 3–3½ feet in height. Leaf blades are 7–11 mm wide and smooth but rarely rough. Auricles are small to prominent, and the ligule is a short membrane.

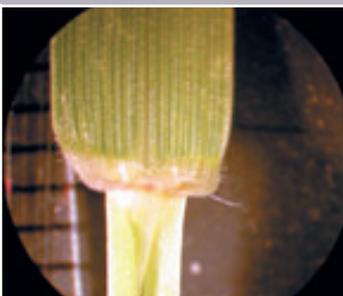
**Habitat:** Wheat is a commonly cultivated agronomic crop grown in many soil types, but volunteer wheat can persist in any disturbed site in wheat-growing areas. It can also be a contaminant in turfgrass settings where its straw was placed on the soil surface during seedling establishment.

**Distribution:** Volunteer wheat is found throughout Missouri and other wheat-producing areas of the United States.

**Similar species:** Some of the ryegrass species (*Lolium* spp.) have a similar growth habit but a glossier texture.



Small to prominent auricles.



Collar region: short, membranous ligule.



Volunteer wheat.

## PERENNIAL GRASSES

### Bermudagrass

(*Cynodon dactylon*)

**Description:** Bermudagrass is a creeping, wiry grass that forms dense mats from rhizomes and stolons. It can be valued as turfgrass or forage in some areas, but in other settings is considered a weed. Its leaf sheaths are round and tipped with hairs; the ligule is a short membrane with hairs along the margin. Auricles are absent. The leaf blades are 1–4 mm wide, flat and smooth.

**Habitat:** Bermudagrass can tolerate many conditions, including drought. In cool-season lawns, it can disrupt site color uniformity during dormancy. Agronomically, it is a weed problem in warmer areas such as the southern portions of Missouri.

**Distribution:** Bermudagrass occurs throughout the southern United States north to the Middle Atlantic states. In Missouri, bermudagrass is most frequently encountered south of the Missouri River.

**Similar species:** Nimblewill has similar color, texture and habitat but is a finer species with a higher tolerance for shade and cold temperatures. It also has a smaller membranous ligule.



Collar region: short, membranous ligule with hairs at margin. Seedhead.



Mature bermudagrass.

## PERENNIAL GRASSES

### Broomsedge

(*Andropogon virginicus*)

**Description:** Broomsedge is a perennial grass that forms clumps in many pastures, hay fields, and abandoned fields, and often goes unnoticed until it matures into a reddish brown clump of broomlike leaves. Leaves are folded in the shoot and are without auricles. A membranous ligule occurs that is approximately 1–2 mm long and rounded (sometimes with hairs along the top). Leaf blades are distinctly keeled and approximately 4–6 mm wide and from 4–24 inches in length. Leaves are usually hairy near the leaf base.

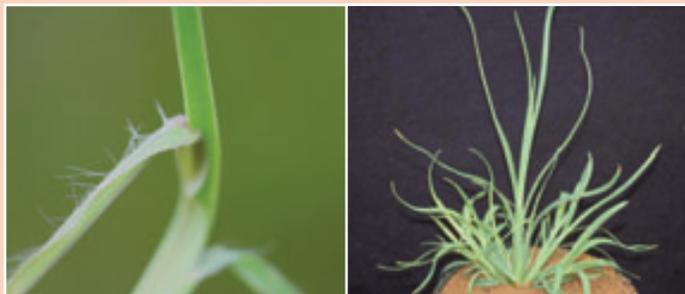
**Habitat:** Broomsedge is one of the most common grass weeds of many pastures and hay fields in Missouri.

**Distribution:** Broomsedge is found in the eastern half of the United States and in California.

**Similar species:** The distinctly flattened and keeled leaves and sheaths that turn reddish brown with maturity help to distinguish this weed from other species that might occur in these environments.



Broomsedge matures into a reddish brown clump of broomlike leaves.



Collar region: membranous ligule; Broomsedge seedling. leaves hairy near the base.

## PERENNIAL GRASSES

### Dallisgrass (*Paspalum* spp.)

**Description:** There are approximately 10 species of dallisgrass that occur in Missouri. It is a coarse-textured grass that occurs in thick clumps through the spread of its short, thick rhizomes. Its leaves are rolled in the bud and are usually flat and 6–15 mm wide. The ligule is a membrane, and auricles are absent.

**Habitat:** Although found in pastures and along rights-of-way, it is most problematic in turfgrass settings. It favors moist conditions.

**Distribution:** Dallisgrass can be found from the Middle Atlantic states west to California. In Missouri, dallisgrass is found more frequently south of the Missouri River. It was originally introduced into the United States from South America as a forage species.

**Similar species:** Large crabgrass seedlings and dallisgrass can be confused because of similar characteristics. However, dallisgrass has short rhizomes, while large crabgrass does not. Also, at maturity, large crabgrass is covered with dense hairs, while dallisgrass is not.



Dallisgrass forms thick clumps and spreads through rhizomes.



Collar region: membranous ligule. Seedhead.

## PERENNIAL GRASSES

### Johnsongrass (*Sorghum halepense*)

**Description:** Johnsongrass is a noxious weed because of its invasive nature. It spreads quickly from its stout rhizomes to form dense colonies. Leaves are smooth on both surfaces, 8–25 mm wide and contain a prominent midvein. Auricles are absent, and the ligule is membranous. As the plant matures, a row of hairs may develop along the top of the ligule.

**Habitat:** Johnsongrass grows in nearly any soil, but it is most troublesome as an agronomic weed of row crops, in pastures and along rights-of-way.

**Distribution:** Johnsongrass is abundant in southern and western Missouri. In the United States, it can be found as far north as the southern New England states, Wisconsin and Michigan.

**Similar species:** Shattercane is closely related but is an annual. Johnsongrass is a perennial with stout underground rhizomes, which shattercane does not have. The seed of shattercane is much larger and rounder than those of johnsongrass. If seedlings are carefully removed from the soil, the seed may still be attached for identification.



Seedhead.

Mature johnsongrass.

## PERENNIAL GRASSES

### Nimblewill

(*Muhlenbergia schreberi*)

**Description:** Nimblewill spreads through its seed and stolons to form dense mats. Its creeping stems root at their nodes. The leaf blades are 1–4 mm wide, flat and smooth but may have a few sparse hairs at their base. The leaf sheaths are slightly compressed and smooth, but sometimes they may have a few long hairs at the tips of their margins. Sheaths also have dark green veins. Auricles are absent, and the ligule is a small membrane.

**Habitat:** Nimblewill grows best in moist, rich soils and is shade tolerant. It is most troublesome in turfgrass and landscape settings and is not a problem of agronomic row crops.

**Distribution:** Nimblewill is scattered throughout Missouri. In the United States, it is found in most areas except the western states.

**Similar species:** Bermudagrass has similar color, texture and habitat. Bermudagrass is a much larger, coarser species and does not tolerate shade and cold temperatures as well as nimblewill. The ligule of bermudagrass is a tuft of hairs, and bermudagrass has both rhizomes and stolons while nimblewill only has stolons.



Mature nimblewill.



Collar region: short, membranous ligule.

## PERENNIAL GRASSES

### Orchardgrass

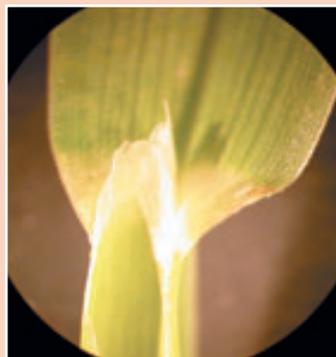
(*Dactylis glomerata*)

**Description:** Orchardgrass is a clump-forming forage grass without rhizomes or stolons. The stems and sheaths are distinctly flat and smooth. The plant is pale green with smooth, folded leaf blades that are 3–8 mm wide when flat. Auricles are absent, and the ligule is a prominent, round membrane but sometimes pointed.

**Habitat:** Orchardgrass may be found in a variety of disturbed sites. It is considered a forage species but may be undesirable in turfgrass because of its off-green color. Its seed is often found as a contaminant in turfgrass seed sold commercially. Orchardgrass is tolerant of partial shade.

**Distribution:** Orchardgrass is a native plant of Europe and has naturalized widely across North America. It is scattered throughout Missouri.

**Similar species:** Goosegrass also has folded leaf blades, but its ligule is much smaller than the large membranous ligule of orchardgrass.



Collar region; prominent ligule.



Orchardgrass forms clumps without rhizomes or stolons.



Seedhead.

## PERENNIAL GRASSES

### **Purpletop** (*Tridens flavus*)

**Description:** Purpletop is a perennial with short, thick rhizomes and is most noticeable from August through October when the plant reaches 4 or 5 feet in height and produces dark purple panicles. The leaves are somewhat flattened and appear folded in the sheath and have a relatively prominent white midvein. Leaves are 8–17 mm wide, usually hairy except near the bases, lacking auricles, and with a ligule that is a fringe of hairs less than 1 mm in length.

**Habitat:** Primarily a weed of hay fields, pastures, abandoned fields and roadsides.

**Distribution:** Purpletop is found throughout the eastern half of the United States and can be found throughout Missouri.

**Similar species:** Barnyardgrass or johnsongrass may occur in similar environments and have a similar appearance as seedlings, but purpletop could easily be distinguished from these other species by its small hairy ligule.



Purple panicles.



Collar region: short, hairy ligule.



Purpletop seedlings.

## PERENNIAL GRASSES

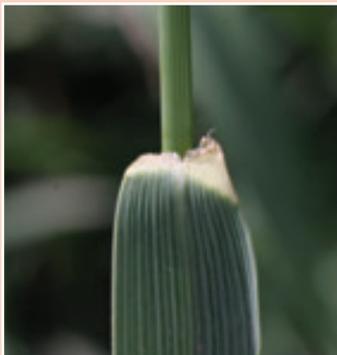
### **Quackgrass** (*Elytrigia repens*)

**Description:** Quackgrass is a rhizomatous grass that can form dense colonies. It can grow more than 3 feet high but will withstand close mowing. The leaves are rolled in the bud with a rough texture and are flat and thin. They may have short hairs or be hairless. The leaves are 3–6 mm wide, and the ligule is a short membrane. The sheath is round to flat and short and hairy. Auricles are present.

**Habitat:** Quackgrass may be found in pastures, fencerows, gardens, rights-of-way, cultivated fields and lawns, as it tolerates close mowing.

**Distribution:** A native of Europe, quackgrass is more common and problematic in the northern United States and Canada. It is scattered in Missouri, primarily north of the Missouri River.

**Similar species:** The ryegrass species as well as tall fescue have auricles, but neither of these species also possesses rhizomes.



Short, membranous ligule.



Mature quackgrass.



Auricles.

## PERENNIAL GRASSES

### Tall fescue

(*Festuca arundinacea*)

**Description:** Tall fescue is a clump-forming, cool-season perennial without rhizomes. Although a valuable forage and turfgrass species, it frequently escapes cultivation. The plant may reach 4 feet in height if left unmowed. The ligule is a short membrane, and its auricles are generally less developed and blunt. The dark green leaves lack hair and are coarse, with prominent parallel veins.

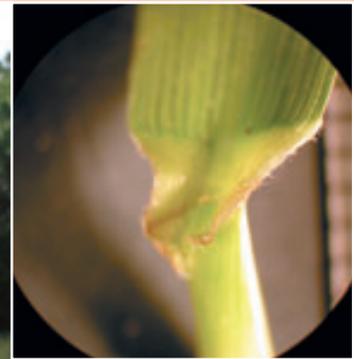
**Habitat:** Tall fescue may be found in many settings, including fields, nurseries and landscapes. It is not common in cultivated fields.

**Distribution:** Tall fescue is common throughout the United States. In Missouri, it is common throughout the state except in the Mississippi lowlands of southeast Missouri.

**Similar species:** Quackgrass, similar in its coarse texture, has well-developed auricles and rhizomes. Ryegrasses have longer auricles and smooth blade texture.



Seedhead.



Collar region: blunt auricles; short, membranous ligule.



Mature tall fescue: clump-forming without rhizomes.

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# GLOSSARY

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**Acute membrane:** A ligule terminated with a pointlike appearance.

**Annual:** Plants that complete their growth from seed to maturity within one growing season. For example, summer annuals germinate in the spring and complete their growth in late summer to early fall; winter annuals germinate in the fall or late winter and complete their growth in the spring to early summer.

**Auricles:** Small appendages that project from the base of the leaf blade and appear to wrap, at least partially, around the grass stem.

**Awns:** Bristles that arise from the spikelet.

**Blade:** Part of the grass plant that is above the sheath; the expanded portion of the leaf.

**Bud:** An undeveloped leaf or flower.

**Clump-forming:** A single grass plant that has few to many stems arising from the same point.

**Collar:** Junction of grass blade and sheath.

**Compressed:** Flat, as in the sheaths of some grasses.

**Decumbent:** Reclining or lying on the ground but with the tips ascending.

**Life cycle:** The length of season to complete a plant's growth. For example, annuals complete their growth within one season; biennials, two seasons; and perennials, more than two seasons.

**Ligule:** A projection at the base of the leaf blade on most grasses; it may be either membranous or a tuft of hair.

**Midvein:** The central or main rib of a leaf.

**Node:** On the stem, a joint or knot that bears leaves.

**Perennial:** Life cycle that requires more than two seasons to complete.

**Rhizome:** Creeping underground stem that usually produces roots and shoots at its nodes.

**Rolled:** Grass leafbud that appears wrapped around and around.

**Sedge:** Plant that is not a true grass but has triangular-shaped stems and leaf blades.

**Sheath:** The lower part of the leaf blade that encircles the stem and younger leaves.

**Stolon:** Creeping stem above the soil surface; it produces roots at its nodes and gives rise to new plants at its tips.

# GRASS WEED SEEDLING IDENTIFICATION KEY

