

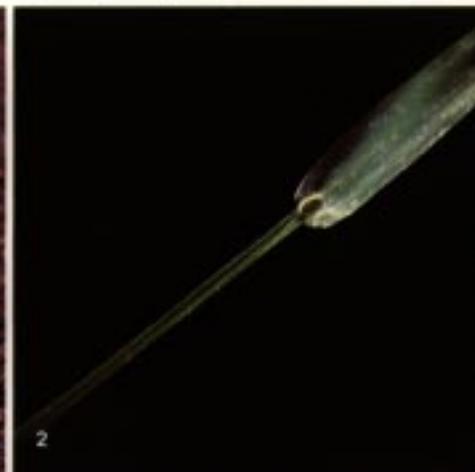
BARNYARDGRASS

(Echinochloa crusgalli)

SEEDLING DESCRIPTION

The first shoot (coleoptile) of barnyardgrass grows $\frac{3}{16}$ to $\frac{1}{4}$ inch (5 to 7 mm) long and is usually reddish. The first true leaf is smooth and green, $\frac{3}{8}$ to $\frac{1}{4}$ inch (1 to 2 cm) long, $\frac{1}{16}$ (2 mm) wide, and rolled in the bud. It is rounded at the base and uniformly tapers to a pointed tip, which may be tinged red. The seedling leaf sheath is distinctly flattened, usually smooth, and often tinged with maroon. The leaf blade is narrow, smooth on both surfaces, and rolled in the bud. Ligule and auricles are absent, and the collar is smooth.

1. Seedlings often have a reddish base.
2. The collar region is completely smooth.
3. Clump of mature barnyardgrass.
4. Distinctive "chicken-foot" pattern of seed heads.
5. Large seeds are a favorite food of wild birds, especially water fowl.



cm) in diameter. Under normal conditions, the roots are within 2 to 6 inches (5 to 15 cm) of the soil surface, but they may extend to 30 inches (75 cm) depending on soil conditions and competition from other plants.

Barnyardgrass grows 1 to 4 feet (0.3 to 1.3 m) tall. The stems are smooth and stout, $\frac{1}{8}$ to $\frac{1}{2}$ inch (3 to 12 mm) thick, and flattened, especially at the base of the plant. The leaves are green, usually with a reddish cast. They are flat, 3 to 20 inches (8 to 50 cm) long, and $\frac{3}{8}$ to $\frac{1}{4}$ inch

BIOLOGY

Barnyardgrass is a summer annual that propagates by seed. Like most annual grasses, it grows in clumps by rooting and branching at the lower joints (nodes) of the stems. This habit, called "tillering," begins roughly ten days after emergence, when the plant is about 4 inches (10 cm) tall. One plant may form as many as fifteen tillers, giving this grass its tufted or patchlike appearance.

The fibrous root system of one clump may spread over an area 30 inches (75

and even young plants respond to the short days of late summer by flowering very quickly. The branched flower head (panicle) is dense, erect or nodding, and 2 to 8 inches (5 to 20 cm) long. It consists of several to more than a dozen compact, purplish green side branches (racemes), on which the seeds develop. The racemes are about as big around as a pencil and are $\frac{3}{4}$ to 2 $\frac{1}{2}$ inch (2 to 6 cm) long. Stiff, bristly hairs develop on the seeds as they mature, giving the racemes a spiny appearance.

The seeds are about $\frac{1}{8}$ inch (3 mm) long. They are flat on one side and round on the other. One plant can produce 7,000 or more seeds, which may germinate in four months or remain dormant for three or four years with little or no loss in viability. A weedy field can produce 2,420 pounds (1100 kg) of seed per acre. The seed is dispersed by wind, water, animals, and humans.

Germination occurs from late spring until August. It is favored by moist compact soils, temperatures ranging from 75° to 90° F (24° to 35° C), and exposure to light. Shallow tillage frequently provides the warmth and light that encourage germination. Most of the seeds germinate within 1 $\frac{1}{2}$ inch (4 cm) of the surface. However, plants that emerge in mid or late summer reach only one-tenth the size of those that germinate in early spring. Because of this reduced growth and the plants' susceptibility to crop shading, late arrivals are not a serious problem.

The plants grow very quickly in the heat of summer. Barnyardgrass is a vigorous competitor for space and nutrients, removing high levels of potassium, phosphorus, and nitrogen from the soil. Heavy stands of barnyardgrass can remove 60 to 80 percent of the soil nitrogen in a crop area.

Barnyardgrass prefers rich, moist soils and continues to grow even when partially submerged. It can withstand dry periods, but during such times its growth and seed yield are much reduced. It is common in open waste places, roadside ditches, pastures, cultivated soils, and ir-

similar variety found in the northeastern United States. Its leaf blades have hairy upper surfaces, whereas the leaf blades of *E. crusgalli* barnyardgrass are hairless. Barnyardgrass is distinguished from all other grasses by the absence of ligules and auricles; its collar is completely smooth.

NATURAL HISTORY

Originally a European weed, barnyardgrass now grows throughout the world between the Arctic and Antarctic Circles. It prefers low to medium elevations. Sixty-one countries report the weed in thirty-six different crops. In the United States, it is a problem in soybeans, clover, alfalfa, rice, corn, potatoes, sugar beets, and cotton.

Barnyardgrass has a high sugar content and is occasionally used as a forage, but it may accumulate nitrates to levels that are toxic to farm animals.

Although barnyardgrass is generally considered a troublesome weed, it has a few useful relatives. *E. colonum*, or jungle rice (not a true rice), is cultivated in warm countries for fodder. Another variety, *E. frumentacea*, is grown as a green hay crop and for poultry feed. *E. frumentacea* is now being used as an ingredient in birdseed and is recommended for planting in wetlands for wild fowl.

The genus name, *Echinochloa*, comes from the Greek *echinos* meaning hedgehog, and refers to the spiny seeds. The species name *crusgalli*, loosely translated, means "chicken foot," because the spreading racemes of the mature seed head resemble the spurs on a rooster's leg.

Other common names for barnyardgrass are barnyard millet, watergrass, summergrass, cockspur grass, and cocksfoot.

CONTROL

In cultivated areas, preventing this grass from seeding is one of the best methods of control. A disk harrow or rotary hoe may be used to kill young plants before they form seeds. Fall plowing and shallow till-

good competitors. Mowing is ineffective, for the plants quickly regenerate.

Studies done in Arkansas illustrate the competitive effects of barnyardgrass in rice fields. Heavily infested rice was sprayed with different rates of the herbicide CIPC. At 4, 6, 8, and 10 pounds of herbicide per acre, yields were 85, 90, 94, and 96 bushels per acre, respectively. The yield on the untreated plots averaged only 56 bushels per acre. Flooding in rice remains an important control method. Rotations that include rice and soybeans or oats are also effective.

In the Netherlands, experiments are being conducted using the fungus *Cochliobolus lunatus* as a control agent for barnyardgrass. This fungus has been quite successful under field conditions and shows some promise as an effective control in the future.

Most herbicides that control grasses also control barnyardgrass. These include Atrazine, Bladex, or Dual in corn, and Fusilade, Dual, or Amiben in soybeans. In established alfalfa, Paraquat may be used between cuttings to control barnyardgrass and other annual grasses. In new legume seedings, Eptam or Benefin may be applied before planting.

For specific recommendations, consult your county Extension agent or the most recent *Weed Control Manual and Herbicide Guide*, available through Meister Publishing Company, 37841 Euclid Avenue, Willoughby, Ohio 44094. Follow label instructions for all herbicides and observe restrictions on grazing and harvesting procedures.

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Where trade names appear, no discrimination is intended, and no endorsement by the Cooperative Extension Service is implied.

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