

GREEN FOXTAIL

(*Setaria viridis*)

SEEDLING DESCRIPTION

The seed leaf (coleoptile) of green foxtail is pale green or greyish, very narrow, and only $\frac{1}{10}$ to $\frac{1}{8}$ inch (2 to 5 mm) long. The first true leaf grows about $\frac{1}{8}$ inch (20 mm) long and $\frac{1}{8}$ inch (3 mm) wide. True leaves are rolled in the bud and smooth on the lower surface. The upper surface is smooth or has a few sparse hairs. The stem and sheath are smooth, and the sheath margins are split and overlapping, with short upward pointing bristles along each edge. The ligule is a row of hairs less than $\frac{1}{2}$ inch (0.5 mm) long. Auricles are absent.

BIOLOGY

A summer annual grass, green foxtail has a fibrous root system and reproduces by seed. It grows 1 to 4 feet (15 to 115 cm) tall and is erect rather than sprawling. Green foxtail often grows in clumps because of tillering (rooting at the joints or nodes on the lower stems). Stems are smooth and usually hollow in the center. The leaf sheath is smooth except for the margins, which are lined with short, upward-pointing hairs that are especially noticeable near the collar. The ligule is a fringe of hairs about $\frac{1}{16}$ inch (1 to 2 mm) long. Auricles are absent.

1. Seedlings are slender.
2. Hairy ligule; note hairs on upper sheath margins.
3. Upper leaf surface is smooth.
4. Green foxtail seed heads are usually green.
5. Seed heads may be purple.
6. Plants turn tawny yellow in fall.



cylinder, 1 to 5 inches (2.5 to 12 cm) long, and ½ to 1 inch (1 to 2.5 cm) wide, including awns. Awns are usually green, but occasionally purple, and all are covered with tiny barbs. The barbs point upward, so the panicle feels soft and fuzzy when stroked toward the tip. The panicle is usually erect but may nod slightly.

Within forty days of germination, foxtail seedlings can grow to maturity and produce seeds that sprout immediately if temperatures are between 68° and 95° F (20° to 35° C). Seeds germinate best from shallow depths, within ½ to 1 inch (1 to 2.5 cm) of the surface. They do not emerge from depths below 5 inches (12.5 cm). Seeds can remain viable up to thirty-three months when stored dry at room temperature — not an extremely long life compared with some weed seeds, which still sprout after fifty years of dormancy. Despite this short viability period, green foxtail remains a serious weed problem because it produces a large number of seeds that germinate almost immediately. This characteristic enables green foxtail to form dense competitive stands in spring-sown crops.

Green foxtail grows best in sandy to loamy soils that have good fertility and plenty of moisture. It grows in cultivated fields, gardens, and other disturbed soil, in pastures, lawns, and waste places, and along roadsides and embankments. The weed is an alternate host for nematodes (*Meloidogyne* species) and for the virus that produces black-streaked dwarf diseases of rice.

Foxtail grasses can cause infections and abscesses in livestock when the awns become lodged in mouth, nose, and eye tissues.

Foxtail can also cause abnormal growth in certain crops, including corn and some vegetables. Research on these crops shows that toxicity occurs when chemicals produced by foxtail roots travel through the soil and are absorbed by the roots of vegetable plants. This interaction, called "allelopathy," enables some weeds to reduce competition by stunting nearby vegetation.

densely lined with upward pointing hairs, while those of fall panicum are smooth.

The three foxtails (*Setaria* sp.) most common in the United States are green, yellow, and giant foxtail. Mature plants are easy to identify if seed heads (panicles) are present. Green and yellow foxtails are named for the color of the fuzzy bristles (awns) on their seeds. Giant foxtail (*Setaria faberii*) has a large drooping seed head that grows up to 8 inches (20 cm) long.

Close inspection is necessary to distinguish among the three grasses in their early growth stages. Yellow foxtail (*S. glauca* or *S. lutescens*) is easily identified by the ¼-inch (6 mm) long cobwebby hairs on the upper surface of the leaf blade, near the base. The entire upper leaf surface of giant foxtail is covered with fine hairs ½ inch (less than 1 mm) long, which give the surface a velvety texture. Green foxtail may have a few scattered hairs on its leaf blades, but it is usually smooth bladed.

The most important identifying characteristics of green foxtail are the short hairy ligule, smooth leaf blade, short haired leaf sheath margins, and cylindrical seed head.

NATURAL HISTORY

The most common *Setaria* species in the northeastern United States, green foxtail was originally introduced from Europe, probably as a contaminant in crop seed and in the ballast of ships. It is a problem in temperate countries throughout the world. In the tropical belt, it grows only at high elevations where temperatures are cool.

Green foxtail grows well and competes heavily in cereals and vegetables, and in legume crops such as peas, beans, and lentils. In the United States it is a principal weed of corn, soybeans, sorghum, sugar beets, cotton, flax, and cereals. It also infests pastures, orchards, vineyards, many vegetables, and irrigated crops. While natural stands of foxtail are sometimes used for pasture, the weed is generally not encouraged because it is so com-

grass, green bristle grass, pigeon grass, and wild millet.

CONTROL

Since seeds can germinate over the entire summer, full-season control of this weed may be difficult. A combination of cultural and chemical controls is advised. Most preemergence herbicides are effective in controlling foxtail if applied at the recommended time and rate. However, herbicides applied very early in the season often lose their effectiveness by the time foxtail germination is at its peak. This can cause foxtail problems in fields planted early.

Row crops, such as soybeans and corn, favor the growth of foxtail. Therefore, a rotation that includes a solid-stand crop, such as legume or grass hay, should help keep this weed under control. Mowing before foxtail seeds mature is a cost-effective way to prevent its spread in solid stand forages. An effective cultural method for controlling foxtail in row crops is to provide early canopy closure by planting narrow rows and supplying the nutrients necessary for vigorous crop growth.

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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