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Blackgrass

Alopecurus myosuroides Huds.

S. Aldrich-Markham

Blackgrass (*Alopecurus myosuroides* Huds.), also known as *slender foxtail*, ranks, with wild oats and annual ryegrass, among the most important grass weeds in winter cereal production in Europe. It infests other winter crops there as well, including grass seed, rapeseed, and forage legumes.

Although it's not yet widespread in the United States, it's been introduced into a number of states, including Washington and Oregon. There are several infestations in eastern Washington, in Lincoln, Spokane, and Whitman counties. Plants have been found within a mile of the Idaho border. The only infestations in Oregon are in the Willamette Valley, in Yamhill County near the border with Polk County. Blackgrass has become a serious problem in these areas, where winter wheat is an important crop. It's listed as a noxious weed in Washington.

Figure 1.—Blackgrass (left) is distinguishd by the dense, cylindrical seedheads that are more slender and more tapered at the ends than those of meadow foxtail (right).

Figure 2.—Blackgrass is a winter annual that may grow to 3 feet tall.

Because of its extremely high seed production capability, blackgrass has the potential for rapid spread. It's a winter annual, and the cultural practices used for winter grains suit blackgrass as well. It can reduce yields dramatically because it starts rapid growth early in the spring, competing with the grain for resources. In test plots in Washington, uncontrolled blackgrass reduced winter wheat yields by as much as 42%, with an average yield loss of 25%. Most of the abundant blackgrass seeds are shed before the grain is harvested.

IDENTIFICATION

The seedheads of blackgrass are dense and cylindrical, similar to those of meadow foxtail (*Alopecurus pratensis* L.), a perennial species commonly planted for pasture in wet areas (figure 1).

Blackgrass seedheads have a smaller diameter in proportion to their length than meadow foxtail and are more tapered at each end. They're usually reddish-purple in color, giving the appearance, from a distance, of a "black grass." The two species are among the earliest grasses to flower in the spring, blackgrass flowering slightly later than meadow foxtail.

Blackgrass plants grow up to 3 feet tall (figure 2). The seedheads are from 1 to 5 inches

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long and ⅛ to ¼ inch in diameter, tapering at each end. Each spikelet has a single floret, enclosed by two keeled glumes of equal length.

The lemma, palea, and glumes remain attached to the seed when it's shed. The lemma has a bent awn, about ¼ inch long, protruding from near the base (figure 3). These small, delicate awns give the seedhead the appearance of having short hairs.

The leaves are hairless, with an open sheath, and rolled in the bud. The sheaths can be green or purplish. There are no auricles. The ligules are membranous, with a jagged edge (figure 4).

BIOLOGY AND ECOLOGY

The most significant feature of blackgrass as a weed is its high seed production. One seedhead commonly produces 100 to 200 seeds. A researcher in England found an average of 1,550 seedheads per square meter in wheat fields under reduced tillage. This corresponds to over 30,000 seeds per square foot. At lower plant densities, each plant produces more seedheads.

Blackgrass seed loses dormancy within 2 months of maturity; then it can germinate. It can remain viable in the soil when buried for as long as 7 to 9 years. The percentage of viable seeds in cultivated soils, however, declines rapidly when replenishment with new seeds is prevented.

A researcher in England observed that a 3-year rotation out of cereals into grass silage (where the blackgrass was cut before heading) considerably reduced, but didn't eliminate, viable seeds from the soil. It didn't prevent a recurrence of blackgrass in the following cereal crop, and failure to control the weed in that crop allowed new seeds to enter the soil.

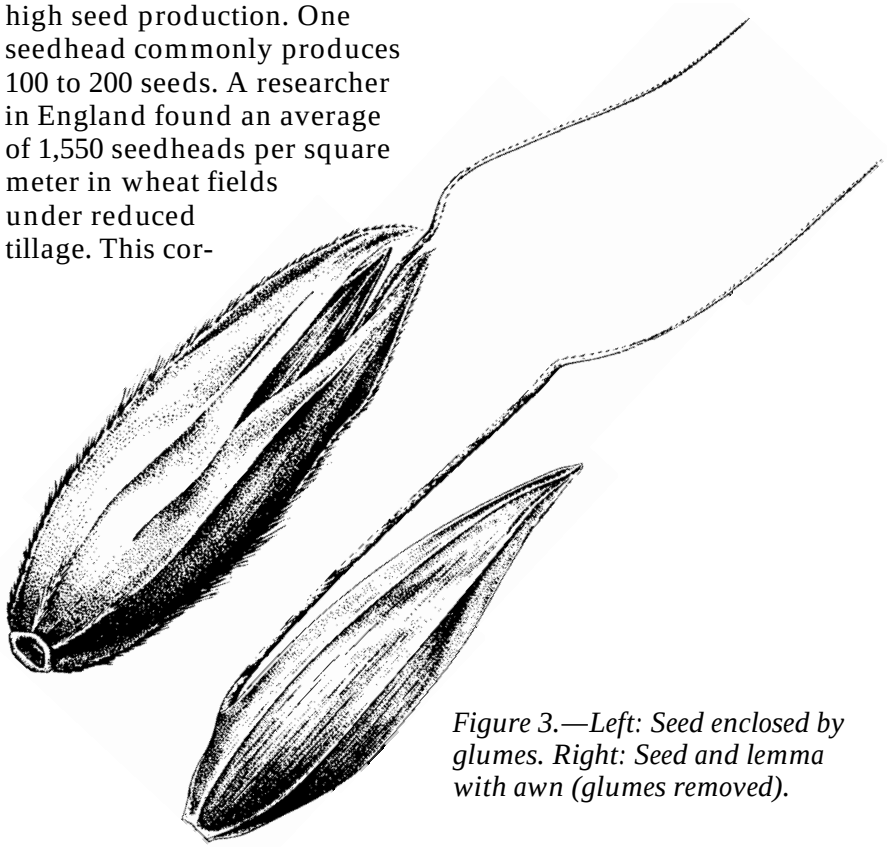

Figure 3.—Left: Seed enclosed by glumes. Right: Seed and lemma with awn (glumes removed).

The seeds germinate over a wide range of temperatures, with high germination between 48 and 77°F. Germination occurs all year long, with peaks in fall and spring. In winter grains, most of the blackgrass seeds germinate in the fall. Those emerging in the spring are likely to be suppressed by crop competition except in thin or late-planted stands.

Blackgrass plants stop growing at about 40°F. Tolerance to cold temperatures depends on the stage of development. At the one- to two-leaf stage, plants can survive temperatures down to 18°F; larger plants can survive –13°F. Cold temperature tolerance is improved with good soil moisture.

Blackgrass prefers moist soils. It grows most abundantly in the low areas of fields and on heavy soils with a high winter water table, but it's not confined to these areas.

Native to the Mediterranean region, blackgrass is now a major problem in Germany, Belgium, France, and Great Britain, as well as parts of Italy, Yugoslavia, and Turkey. Its spread through Europe has been tied to the expansion of winter wheat and barley acreage, under modern, mechanized cultivation.

There are several factors in modern grain production that have favored the spread of blackgrass in Europe:

- The suppression of most broadleaf weeds with herbicides has favored grass weeds such as blackgrass by reducing competition.

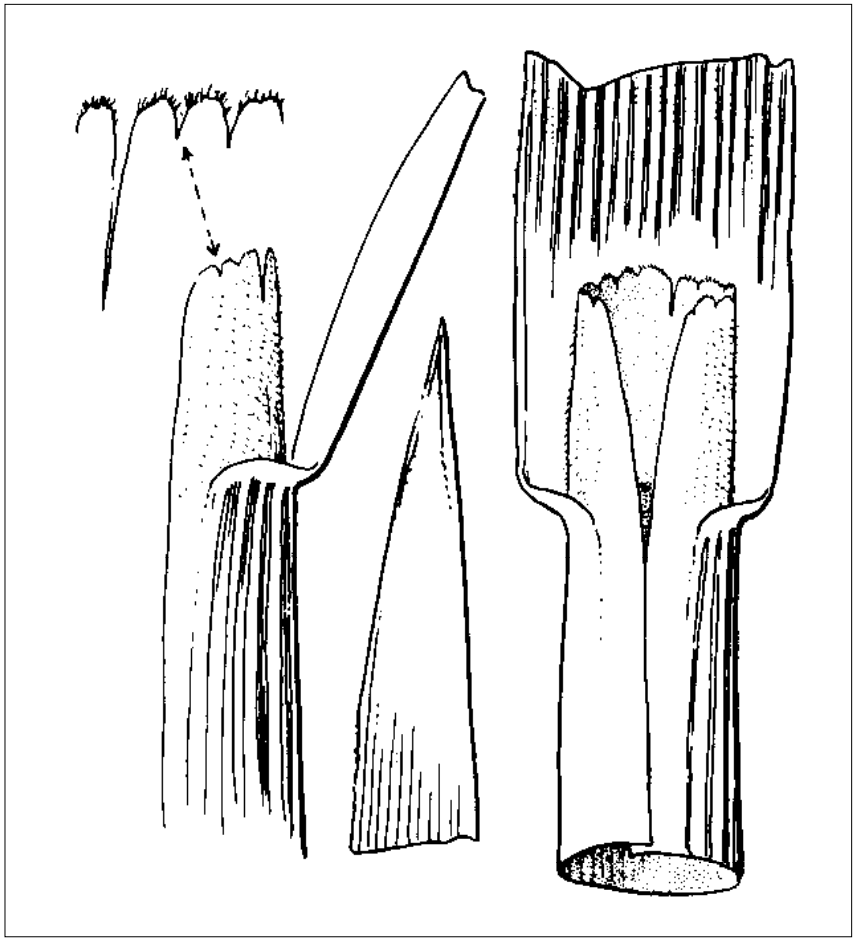

Figure 4.—Ligule, front and side views. Center: leaf tip.

- The deterioration of soil structure caused by compaction from heavy equipment and by reduction of soil organic matter has created a favorable environment for blackgrass, which thrives in heavy, moist soils and tolerates poor drainage.
- Blackgrass responds well to high nitrogen fertilization with increased tiller and seed production.
- Using combines for harvesting favors the dispersion of seeds—60 to 90% of the seeds are shed by the time of harvest, and the rest are spread over the field with the chaff.
- Distribution of contaminated cereal seed has also contributed to the spread of this weed.

PREVENTION

- Plant certified seed.
- Rogue or destroy new infestations.
- Clean equipment, especially combines.
- Cut infested areas last or separately.

CONTROL

CULTURAL. A high level of control is needed to prevent an increase in blackgrass seed reserves in the soil. Cultural control practices need to be used in combination with chemical control, because even a partial failure of chemical control will allow a rapid weed buildup.

Rotation out of winter grain to a spring crop or a perennial crop is effective in reducing infestations. Tillage for a spring crop will kill fall-germinated blackgrass. In perennial crops, the blackgrass seedlings have difficulty competing with existing vegetation. Delaying fall planting of grain allows more weed seedlings to emerge, which are then destroyed by tillage.

Reduced tillage systems favor blackgrass. Surface tillage creates an ideal seedbed for the weed, but when grain is drilled directly into straw from the previous year (no-till), the heavy residue inhibits blackgrass establishment.

The most effective practice for reducing infestations is plowing, which buries the seed and reduces the number of seedlings that can germinate. In England, a study of blackgrass populations under different cultivation systems showed that, after 4 years with no grass herbicide:

- tine-cultivated wheat fields averaged 1,550 seedheads per square meter;
- direct-drilled fields averaged 850; and
- plowed fields averaged 110.

The infestations increased under all cultivation systems. In fields where straw was burned instead of baled, the blackgrass populations were lower, but they still gradually increased.

CHEMICAL. Grain growers in Europe find that an annual control program using grass herbicides is necessary to prevent blackgrass populations from increasing. Control in the early stages of growth is important because blackgrass competes with the grain during the period of early spring growth—and it can seriously reduce yield.

Populations of blackgrass resistant to the herbicide diclofop-methyl (Hoelon) have been documented in Great Britain.

Since herbicide registrations change frequently, resulting in more or fewer available herbicides and changes in permissible herbicide practices, this publication doesn't make specific herbicide recommendations.

For current recommendations, refer to the *Pacific Northwest Weed Control Handbook,* published and revised annually by the Extension Services of Oregon State University, Washington State University, and the University of Idaho.

In addition, detailed instructions for herbicide use are provided on herbicide container labels and in other literature provided by herbicide manufacturers.

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