Little Barley

***Hordeum pusillum* Nutt.**

Little barley is a native, clump-forming winter annual grass, distributed across most of the United States and southern Canada. This species is commonly found in fallow crop fields, poorly managed pastures, disturbed soils along roadsides, waste areas, and croplands. Emergence occurs in the fall as well as in the spring. Little barley can be found across many soil types and it grows particularly well in alkaline soils.

This weed has historically been ranked among the 10 most troublesome weeds in pasture and small grains, in the southern states. Its stiff, barbed seedheads can cause eye, mouth, and digestive tract injuries to grazing livestock as well as significantly lowering the value of forage and hay production. Despite its documented presence in winter cereals, no studies have quantified yield loss in crops competing with little barley.



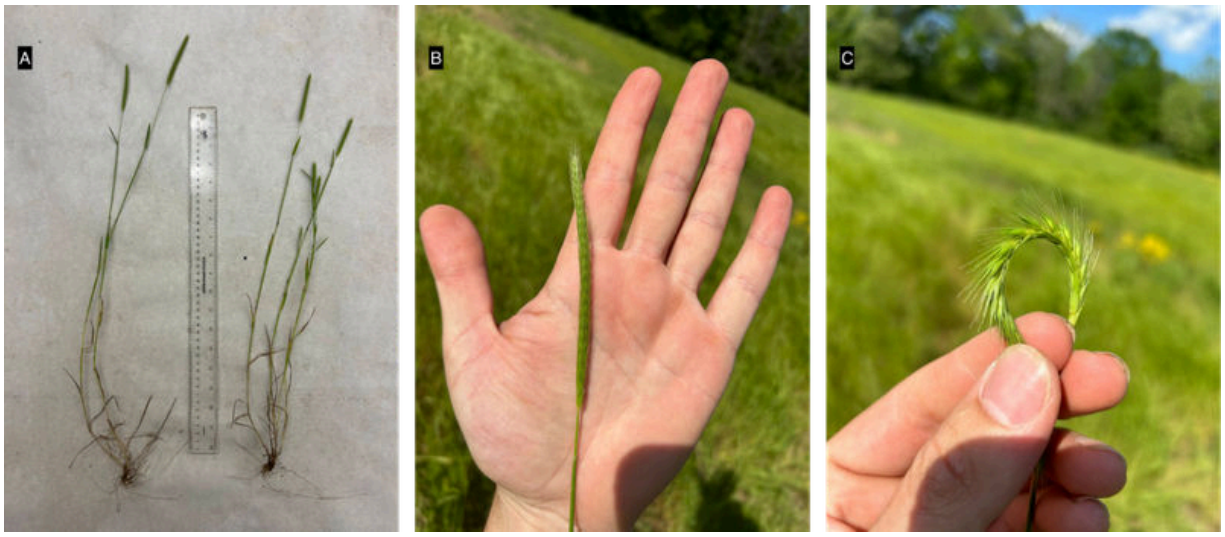


Little barley clumping formation. (Photo credit: Eduardo Lago, Southern Illinois University-Carbondale)

Identifying Features

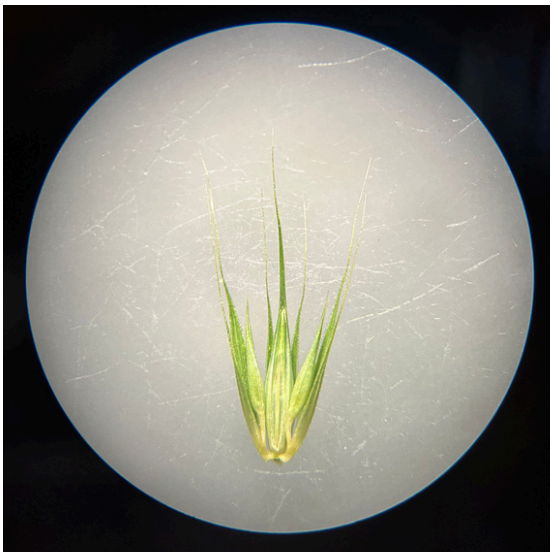
Plants typically grow 5 to 16 inches tall in dense populations (see image above). The seedhead is a 1-to-3-inch long spike, composed of alternating groups of three spikelets. Each group of three spikelets produces one central fertile seed and two lateral sterile florets. Spikelets mature and break off from the top of the spike downward.

Identifying Features (cont.)



A. Little barley mature plant height; B. Entire inflorescence; C. Seed head spikelets. (Photo credit: Eduardo Lago, Southern Illinois University-Carbondale)

The leaves of little barley are erect and flat, measuring between one-half an inch to nearly 3-inches in length (2 to 7 cm) and less than a quarter inch in width (10 to 14 mm). The lower leaf surface is smooth or slightly hairy, while the upper leaf surface is slightly rough to the touch. The roots are fibrous and shallow, reaching a depth of 6 inches in the soil.



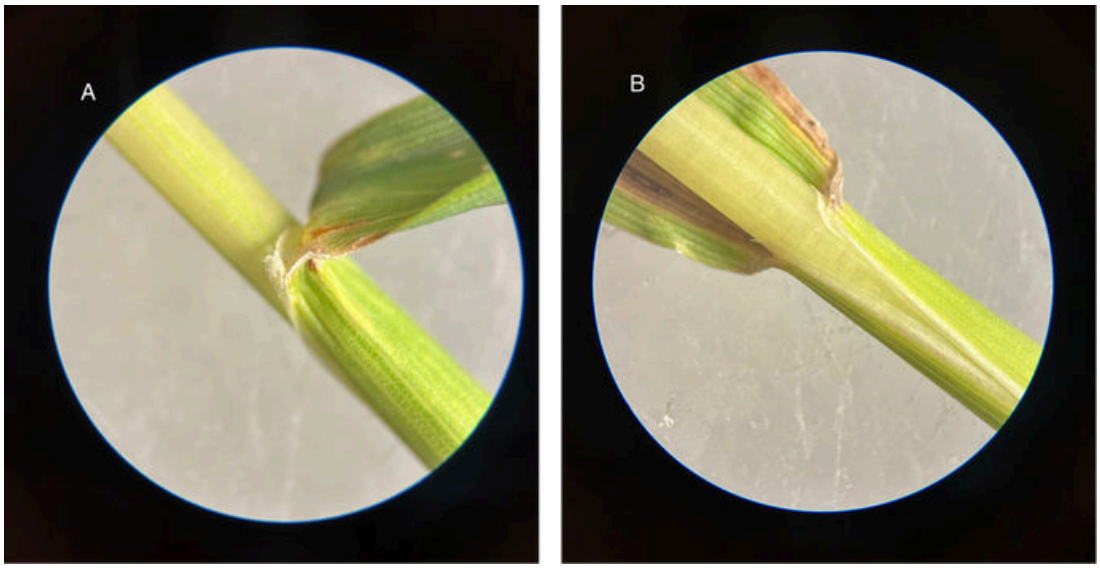
Little barley spikelet. The central floret produces a seed; the two lateral ones are infertile. (Photo credit: Eduardo Lago, Southern Illinois University-Carbondale)



Little barley seedling. (Photo credit: Eduardo Lago, Southern Illinois University-Carbondale)

Identifying Features (cont.)

Seedlings have small, truncated membranes called ligules found where the plant's leaves attach to the stem; these ligules extend upwards 0.2 to 0.6 mm long. The leaf blades are flat or slightly folded. The area where the leaf meets the grass stem (collar region) is hairless, clasping leaf lobes (auricles) are absent, and the leaf sheath is open at the collar region.



The collar region of little barley, where the leaf sheath clasps the grass stem: A. Truncate ligule – the ligule or papery membrane above the leaf is short and flat at the top; B. Absent auricles – the leaf does not clasp the stem, and the leaf sheath is open down the stem. (Photo credit: Eduardo Lago, Southern Illinois University-Carbondale)

Seed Production

Like other winter annual grasses, little barley seems to require a vernalization period to produce seeds. Plants germinating in the spring are likely to remain in the vegetative stage and not reproduce, while plants that germinate in the fall can produce more than 60 tillers and more than 2,000 seeds per plant. The seed matures relatively quickly, with viable seeds present within 11 days of seedhead emergence. Seeds are relatively small, with about 30,000 seeds making up a pound. The plant has an indeterminate life cycle, meaning that seeds on the spike do not mature uniformly. Seed heads shatter on the ground as they mature, and seed viability in the soil decreases after three years.

Seed Production (cont.)

Little barley can produce large amounts of biomass with studies documenting more than 4,900 lbs of dry matter per acre, which can be similar to the biomass of wheat. Little barley biomass can cover around 90% of the soil as early as January and more than 95% by April.



Biomass produced by little barley. (Photo credit: Eduardo Lago, Southern Illinois University-Carbondale)

Herbicide Resistance

While herbicide resistance has been documented in similar species, foxtail barley (H. jubatum L.) and wall barley (H. murinum L.), there is no documented herbicide resistance in little barley.

Integrated Weed Management

Cover Crops

Cover crops have been shown to suppress weeds through competition and indirect effects. Cereal rye mixed with hairy vetch has been shown to reduce winter annual weed biomass by 72%, while some research shows that cereal rye alone may be able to reduce weed biomass by 98%. Research has not specifically investigated the impact of cover crops on little barley.

Integrated Weed Management (cont.)

Crop Rotation

Because little barley is a winter annual grass, it is difficult to selectively manage in winter cereal crops and rotating to a broadleaf winter crop such as canola allows the use of selective grass killer herbicides (Group 1) to control it effectively. Spring rotation of summer annual crops allow fall and winter emerged plants to be controlled by spring tillage or burndown herbicides applied before planting. In forage systems, rotating grass hay and pasture fields to alfalfa allows the rotation of herbicide options.

Mechanical Control

Sequential mowing in pasture generally reduces the competitive ability of weeds, where chemical control and crop rotation become more limited. Mowing can kill or suppress annual weeds by depleting carbohydrate reserves and preventing seed production. Tillage can control little barley and reduce its seedbank when executed before seedheads emerge in early spring, disrupting the plant's life cycle and preventing seed maturity.

Harvest Weed Seed Control (HWSC)

HWSC cannot yet be confirmed as a viable management tool for this species, as plants are short statured and seeds tend to shatter shortly after maturing; further studies are required to test seed retention and HWSC effectiveness.

Herbicide Control Options

Below are herbicides that show efficiency (>80% control) on little barley, according to Mississippi Weed Control Guidelines 2023, Winfield Crop Protection 2024, and 2025 Weed Management Suggestions for Mississippi Row Crops. Always check the label and local restrictions.

Herbicide Control Options (cont.)

Cotton	**Preemergence**	pyroxasulfone/Group 15 (Zidua)[2]; glyphosate/Group 9 (Roundup PowerMax 3); paraquat/Group 22 (Gramoxone SL 3.0)
Corn	**Preemergence**	pyroxasulfone/Group 15 (Zidua)[2]; paraquat/Group 22 (Gramoxone SL 3.0)
	Over the top postemergence	atrazine/Group 4 (Atrazine 4L); glyphosate/Group 9 (Roundup Powermax 3)[1]
Peanut	**Preemergence**	glyphosate/Group 9 (Roundup Powermax 3); paraquat/Group 22 (Gramoxone SL 3.0)
Rice	**Preemergence**	glyphosate/Group 9 (Roundup Powermax 3); paraquat/Group 22 (Gramoxone SL 3.0)
Sorghum	**Preemergence**	glyphosate/Group 9 (Roundup Powermax 3); paraquat/Group 22 (Gramoxone SL 3.0)
Soybean	**Preemergence**	pyroxasulfone/Group 15 (Zidua)[2]; paraquat/Group 22 (Gramoxone SL 3.0); glyphosate/Group 9 (Roundup Powermax 3)
	Over the top postemergence	glyphosate/Group 9 (Roundup Powermax 3)[1]
Wheat	**Preemergence**	pyroxasulfone + carfentrazone-ethyl/Group 15 +14 (Anthem Flex); pyroxasulfone/Group 15 (Zidua SC)

NOTE: These are examples of effective active ingredients; this may not be a comprehensive list. There may be other tradenames of these active ingredients, and these active ingredients may be a component of premixes, as well. Always check with your local Extension weed specialist for recommendations for your region. Always read and follow the label.

[1]Requires corresponding herbicide-tolerant trait for crop safety
[2]Herbicide can be applied in the fall.

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Resources

https://extension.msstate.edu/publications/weed-control-guidelines-for-mississippi

https://plants.sc.egov.usda.gov/DocumentLibrary/plantguide/pdf/pg_HOPU.pdf

https://ncwss.org/proceed/2002/ResRep2002/39.pdf

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