Some Weedy Grasses Injurious to Livestock, Especially Sheep

L. H. Pammell
Iowa State College
Some Weedy Grasses Injurious to Livestock, Especially Sheep

By L. H. Pammel

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS

C. F. Curtiss, Director

BOTANY SECTION

AMES, IOWA
Some Weedy Grasses Injurious to Livestock, Especially Sheep

BY L. H. PAMMEL

Several of our weedy grasses are causing considerable trouble to sheep and cattle, particularly in southeastern Iowa where the sheep industry is of considerable economic importance. Not only do these grasses produce mechanical injuries impairing the eyesight, but the awns and bristles penetrate the skins, gums and throats of animals. The pelts of sheep are rendered worthless in some cases by these mechanical injuries or bring below 50 percent of the normal price. The wool is greatly deteriorated by the presence of plant burs, spines and awns, and may sell for as little as 50 percent of the normal price.

The weedy grasses considered in this circular are poverty grass, bristly fox-tail, squirrel-tail grass, wild barley and awned brome grass. All of them are common in Iowa.

**Poverty Grass***

Poverty grass is a tufted annual with slender branching culms from 6 to 20 inches tall, narrow leaves with edges which roll up, sheaths smooth, the base of the leaf (ligule) with a fringe of short hairs. The spikelets are in panicles, four to six flowers in each, the spikelets with a single flower, long slender empty scales or chaff awn-pointed, the lemma or flowering glume with three nearly equal spreading awns, the so-called seed or fruit with a sharp-pointed soft hairy callus. The awns are sensitive to moisture and twist somewhat when dry. Poverty grass is common in southeastern Iowa where it occurs on either gravelly, thin acid clay or sandy soils. It is extremely common on the clay slopes, acid soils and sandy flats along the Mississippi between Burlington and Fort Madison and south. At Mount Zion, Farmington and Sandusky it is abundant. The slopes of pastures formerly covered with shrubs and trees are

---

*The prevalence of this grass and the injury caused by it to livestock have been called to the author's attention by many people. In 1927, Mr. Arthur J. Secor, county agent of Van Buren County, informed me of serious injury to sheep caused by poverty grass. In 1928 Mr. W. T. Maakestad, county agent of Mahaska County, wrote about the seriousness of the spread of the weed in pastures. Dr. C. R. Fry, Centerville, speaks of the injury to the eyes of sheep caused by the beards of the grass which become entangled in the wool about the head and neck.

(1) Keokuk, 1901 (L. H. Pammel and Inez Mitchell, P. H. Rolfs); Clarinda, 1921 (H. L. Elchling); West Davenport (Barnes and Miller); Creston, 1902 (M. V. Ashley); Chickasaw County, 1928 (W. D. Spiker); Mount Pleasant (J. H. Mills); Mount Ayr (Ringgold Record); Eddyville, 1928; Bloomfield, 1928 (L. H. Pammel, G. L. Unser); Ames, 1896; Decatur County, 1897, 1893, 1903 (J. P. Anderson, M. L. and T. J. Fitzpatrick); Birmingham (L. H. Pammel, A. J. Secor); Mount Pleasant, 1923, Melrose and Doud, 1922; Montrose, Albia, Milton, Fort Madison, Sterling, Keokuk and Cantril, 1928: Oakland Mills 1924; Council Bluffs, Clariton, New Hampton, 1925; Keosauqua, 1924, 1925, 1928 (L. H. Pammel). It was also observed by the author in Burlington, southern Jasper County and Henry County.
covered with it so thickly that no other vegetation is generally in evidence. In places where it is less abundant, it is commonly associated with the spreading horse-weed (*Erigeron divaricatus*), which is also distasteful to sheep. In more open places it is associated with sour dock (*Rumex crispus*), mullein (*Verbascum Thapsus*), bull thistle (*Cirsium lanceolatum*), Jimson weed (*Datura Stramonium*), dog fennel (*Anthemis Cotula*), prickly sida (*Sida spinosa*), and lady’s thumb (*Polygonum Persicaria*). In many places the poverty grass crowded out the Canadian blue grass (*Poa compressa*) and red top (*Agrostis alba*), which ordinarily do very well on these acid soils. There was no tendency for the grass to spread in pastures covered with buckbrush or in non-acid soils.

The western three-awned poverty grass (*Aristida fasciculata*) has long been recognized as a troublesome grass to sheep in Arizona. Occasion­ally death results from it. I have reported on the injury from several species of poverty grasses in my Manual of Poisonous Plants. The trouble begins the latter part of August when the seed is ripe and lasts until the snow covers the ground. The fruit of the Iowa poverty grass sticks to clothing and makes one quite uncomfortable walking thru the field. While cattle are troubled somewhat, it is most injurious to sheep.

---

*Fig. 1. Poverty grass (*Aristida oligantha*).*

Poverty grass is an annual and is easily killed by cultivation, but in these permanent pastures on the slopes of hills often badly gullied the grass is hard to treat by cultivation. Some farmers have tried burning the grass off when it matures. It would be better to burn it off just before maturity. The crude oil burners now commonly used by railroads might be used to burn badly infested fields. Planting various native legumes, such as the prairie clover (*Lespedeza*), sweet clover and alfalfa will help to eradicate this weed. Mr. Arthur J. Secor has conducted an interesting experiment on the farm of Samuel Rail in Van Buren County. I saw this field on December 1, 1928. The legumes completely covered the ground. Mr. Secor writes:

"Samuel Rail of Lick Creek Township, Van Buren County, called my attention to damage he was having by this grass in his fine flock of sheep, and he wondered if the Farm Bureau would be able to give him some help in controlling or eradicating the poverty grass.

"It so happens that this grass was in his permanent pasture containing some stubble and interfered with rotation and general cultivation; so in the spring of 1928 we took up the matter of seeing what we could do. We were advised by the Soils Department (Extension Service) that the applica-
tion of some kind of fertilizer and reseeding under the permanent pasture improvement plan might be the best thing. We have a demonstration of this kind. First, give this land a treatment of limestone because of acidity, following with a treatment of about 200 pounds of superphosphate of 16 percent of phosphoric acid per acre. On some of the plots we used ammonium
nitrate and reseeded certain plots with mammoth clover, alsike clover, common sweet clover, alfalfa and a small quantity of timothy. The seed was all disced into the land about the first of April.

"I last examined the plot on about August 10. I found these seedlings had made a very good growth of plants, especially mammoth clover. There was very little sign of the poverty grass."

There are eight species of poverty grasses in Iowa. The long-awned poverty grass (Aristida tuberculosa), with a very sharp pointed callus, grows on the sandy soil in Muscatine County; slender poverty grass (A. gracilis) from Keokuk; the intermediate poverty grass (A. intermedia) in sandy soils along the Wapsipinicon River in Jones County. There are two western species known as purple Aristidas (A. longiseta var. robusta) in Plymouth and Lyon counties; purple Aristida (A. longiseta) in northwest Iowa. The purple Aristidas are perennial. Two other species occur in Iowa, poverty grass (A. dichotoma) with short awns occurs in the sandy soil of Muscatine County. Tufted triple-awned grass (A. basiramea) is widely distributed from northeastern Iowa to Muscatine, Iowa City, Ames and Steamboat Rock. This is a perennial with spreading awns and a sharp-pointed fruit.

Tangle Weed, Tangle Grass, Stocking Weed or Bristly Foxtail

For a number of years complaints have been received about tangleweed, a close ally of green foxtail. It has been spreading rather rapidly in western Iowa especially in corn fields. Since sheep are frequently turned into these fields it is a serious menace to wool. Sometimes also it causes a slight mechanical injury to the eyes and nose.

Tangle weed or bristly foxtail is a spreading, much-branched annual from 1 to 3 feet high with short cylindrical heads or spikes and rather narrow leaves resembling those of green foxtail. The lower part of the culms is somewhat bent; sheaths smooth, ligule at base of leaf blade ciliate, fringed with whitish hairs. The head is dense, long, greenish purplish; branches short, the whorls densely flowered; the bristles downwardly barbed. The bristles and seeds work their way into the wool of the sheep, the hides and manes of horses, and the hides of cattle. The "seeds" are difficult to remove and become most annoying. It is said that the rats are effectively kept away from corn bins in South Africa by a cover of this grass, because the "seed" gets into their hides. Many complaints have been received about this weed in Iowa, since it is becoming common in cornfields which in the fall are used by sheep.(3)

(3) The weed was in 1904 reported from Muscatine (Peppert), Mt. Ayr (Beam), Iowa City (Hitchcock), Mt. Pleasant (Mills), Council Bluffs, DeWitt (Pammel), Keokuk (P. H. Rolfs), LeClaire (P. M. Rolfs), Winterset (Carver), Ft. Dodge (Pammel and Sokol), Johnson County (Linder, Macbride).
Dr. R. A. Craig of Purdue University Agricultural Experiment Station, according to Albert A. Hansen, (*) reported the death of five horses in Huntington County, Indiana. Dr. Craig reports:

"The awns were distributed all thru the lungs and mouth parts. The tongue, which was badly swollen, was completely riddled with the awns and all the mouth parts were badly ulcerated. The lining membrane was completely gone."

The grass is mentioned by Dr. Craig as foxtail (Setaria). It was probably the bristly foxtail or tangle weed (Setaria verticillata).

I have known this weed in Ames for 30 years, at first in a vacant lot. It has now spread and is common in gardens. In southwestern and western Iowa it has become common in cornfields.

The weed is quite common in many parts of Iowa. (*)

The weed is easily killed by cultivation. The customary cultivation of corn should remove it. The practice of rotation of crops is a valuable measure in eradication of this grass. Legumes, sorghum and Sudan grass will suppress the weed.

Squirrel Tail Grass or Wild Barley

This grass, known to botanists as Hordeum jubatum, has long been known as injurious to sheep, hogs, cattle and horses.

It is an annual or winter annual from 6 inches to 2 feet high, producing fibrous roots in compact masses; leaves like those of blue grass but paler in color, from 2-4 inches long, margins sebaceous; flowers in a dense spike from 2-4 inches long, pale green or purplish in color; spike consisting of a number of 1-flowered spikelets, 3 occurring at each joint, 1 being perfect, the other spikelets awl shaped, rudimentary and borne on short stalks, 1 sterile spikelet occurring on each side of the perfect flower, which bears a long awn; at each joint are 6 empty long awned glumes spreading at maturity giving to the plant its bristly appearance; when mature the spike breaks up into joints consisting of the rudimentary spikelets and a perfect flower so


(*)Specimens in the herbarium show that it occurs at the following points: Rockwell City, 1920; Avoca, 1919; Washington, 1916; Mason City, 1822; Spirit Lake, 1918; Pleasant Valley and Thurman, 1925; Ames, 1927; Council Bluffs, 1895, 1898, 1923; Keosauqua, 1924; DeWitt, 1897; Clinton, Winterset and Mount Vernon, 1927; Hamburg, 1918; Liscomb, 1913 (L. H. Pammel); Traer, 1920 (J. W. Provin); Denison, 1922 (M. M. Allencher); Sioux City, 1899 (J. R. Campbell); Fort Dodge, 1916 (F. W. Paige); Washington, 1923 (County Agent); Winterset, 1918 (County Agent); Mount Pleasant, 1897 (J. H. Mills); Muscatine, 1890, 1894 "not common yet" (F. Reppert); Onawa, 1923 (W. F. Coddington); Iowa City, 1887, 1889 (A. S. Hitchcock); Keokuk, 1891 (F. H. Rolfe); Mount Ayr, 1893 (A. F. Bevel); Eldora (L. M. Follet); LeClaire (F. W. Rolfe); Winterset (G. W. Carver); Ollie, Keokuk County, 1928 (W. Hayes); Fort Dodge, 1900 (L. H. Pammel, G. Sokol); LeClaire, Boone County, 1912 (L. H. Pammel, Theodore Macklin); Spencer, 1918 (W. A. Posey).
that each joint has one "seed," the number of "seeds" in a spike varying from 35 to 60.

Squirrel-tail is widely distributed in Iowa. (*) It is all too common in pastures and waste places. It is represented in our collection from the points listed in foot-note:

(*) Waukon Junction, 1913; Boone, 1911; Ames, 1919; South River, 1918; Hawkeye, 1924; Des Moines, 1926; Davenport, 1926; Hubbard, 1926; Missouri Valley, 1897 Webster City, 1895; Council Bluffs, 1895; Carroll, 1895; Logan, 1895; Jefferson, 1895; Missouri Valley, 1897; Ledyard, 1897; Eagle Grove, 1894; Ames, 1895; Dakota City, 1896; Ames, 1909 Fraser, 1914; Missouri Valley, 1897; Webster City, 1895; Clinton, 1901; Calmar Junction, 1901; Garner, 1918; Oelwein, 1915; Council Bluffs, 1898; Carrollton, 1919 (L. H. Pammel); Decatur County, 1904 (Fitzpatrick); Ames, 1893 (F. C. Stewart, H. C. Taylor 1905, G. W. Carver 1894); Beardslee, (J. W. Osborn 1911, H. Ness, G. W. Louthan 1895, M. H. Reynolds 1885, C. R. Ball 1898, S. W. Beyer 1888, A. S. Hitchcock 1883, H. E. Pammel 1909, C. E. Bessey, C. A. Wilson; Ames, 1899 (Edith Gaylord); Algona, 1902 (E. B. Watson); Avoca, 1918 (A. J. Sauders); Algona, 1902 (E. B. Watson); High Bridge, Boone County, 1902 (H. E. Buchanan and G. M. Lummis); Myron, 1901 (C. M. King); Kelley, 1911 (Pearl Clayton); Keystone, 1897 (A. J. Koch); Ledges, Boone County, 1914 (J. V. Ellis); Jewell, 1925 (L. H. Pammel and B. B. Zimmerman); Belknap, 1897
This annual or winter annual is easily killed by cultivation. In pastures which cannot be cultivated the best thing to do is to cut off the plants with a mower after the blooming period.

It has long been recognized that this grass produces mechanical injuries and sometimes death. Aven Nelson (?) was one of the first to call attention to the injuriousness of squirrel-tail grass (*Hordeum jubatum*).

Dr. S. H. Johnson of Carroll a few years ago reported very serious injury to horses. The awns of the grass when taken into the mouth break up into sections, adhere to the mucous membrane and cause deep ulcerating sores, which form under the tongue and lips. Sometimes the lips are completely eaten thru and teeth become loosened. The ulcerating sores become highly inflamed and pus infection sets in. Death results. Sheep, cattle and hogs are also affected.

What is true of the squirrel-tail grass is also true of other wild barleys, such as the little barley.

Dr. K. W. Stouder of the Iowa Agricultural Extension Service wrote concerning this grass as follows:

"In answer to your Inquiry as to whether or not I have met with any cases of poisonous plants in livestock recently I can say that some time ago I saw rather heavy loss of hogs in Montgomery County due to the eating of what sometimes is called squirrel-tail, or what some people call wild barley. Awns of this plant had been collected in cone-like masses beneath the tongue, evidently inserting themselves in the opening of the sublingual salivary gland, and had produced severe stomatitis. Some of the pigs which died were examined post-mortem and it was found that the awns of this plant had collected in a funnel like mass around the pylorus of the stomach and inflammation resulting had prevented the passage of food from the stomach to the small intestine. In addition to this I have seen one case of damage to livestock with some deaths from brome grass."

It is often injurious to feet of grazing animals, giving rise to bacterial infection and ulceration.

**Little Barley**

Little barley known to botanists as *Hordeum pusillum*, is equally injurious as squirrel-tail grass, tho the grass is not as

(A. N. Rankin): Boone County, 1897 (C. A. Steele); Peru, 1897 (D. E. T.); Dysart, 1896 (Emma Stilne); Manly, 1896 (I. A. Williams); Colfax, 1896 (I. J. Mead); Clinton, 1895 (C. R. Ball); Mason City, 1897 (L. G. Parker); Battle Creek, 1897 (E. G. Preston); Taylor County, 1895 (C. O. Pool); Emmet County, 1890 (R. I. Cratty) 1922, B. O. Wolden; Greenfield, 1892 (F. C. Stewart); Muscatine (F. Reppert); Le Claire (F. M. Rolfs); Lake Mills, 1896 (C. E. Keeler); Armstrong, 1882 (R. I. Cratty); Charles City, 1897 (H. C. Anderson); Fort Dodge (F. W. Paige); Fayette, 1893 (Bruce Fink); Jewell Junction, 1895 (G. W. Carver); Hamilton County, 1891 (F. H. Rolfs); Mount Pleasant, 1894 (J. H. Miles); Keokuk, 1891 (F. H. Rolfs); Iowa City, 1888 (A. S. Hitchcock); Marshalltown, 1891 (F. C. Stewart); Amana, 1897 (Conrad Shade); Wheatland, 1895 (C. R. Ball); Harcourt, 1896 (J. G. Danielson); Decorah, 1881 (E. W. D. Holway); Marathon, 1901 (A. E. Paddock); Beaver, 1901 (L. H. Pammel, A. J. Kinzer); Luverne, 1900 (J. C. Blumer).

common. It is an annual, 4-10 inches high; culms more or less geniculate at the lower nodes; sheaths smooth, the uppermost often inflated and enclosing the base of the spike; leaf-blade 1-3 inches long, usually a little pubescent on the lower surface; spikes narrow, 1-3 inches long; empty glumes rigid, the 4 internal ones of each group dilated above the base, those of the central spikelet sublanceolate, all awn-pointed; outer glumes of the imperfect, lateral spikelets setaceous; flowering glume of the central spikelet awned, awn equalling those of the empty glumes; florets of the lateral spikelets awnless, or nearly so.

The weed is widely distributed in Iowa and most common in waste places. (*)

This wild barley is an annual and is easily killed by cultivation. The seed matures quite early in June. The plants in pastures and waste places should be cut off when past flowering and still green. The plants should be cut before the spikes break up into joints.

**Awned Brome Grass**

This annual grass, known to botanists as *Bromus tectorum*, is becoming plentiful in Iowa. In recent years I have seen it abundant in fields, some pastures and along the right of way of railways at Council Bluffs, Carroll, Boone, Ames, Marshalltown,

(*Ames, 1906; Harvey, 1907; Ottumwa, 1899; Council Bluffs, 1893, 1924; Muscatine Island, 1914 (L. H. Pammel); Decatur County, 1904 (J. P. Anderson); Ames, 1917 (B. F. Clarke); Iowa City, 1888 (A. S. Hitchcock); Neola, 1918 (H. E. Jaques); Quarry, 1896 (C. R. Hall); Decatur County, 1897 (T. H. and M. F. Fitzpatrick); Iowa City, 1894 (R. Stevens); Iowa City, 1887, 1889 (A. S. Hitchcock); Morning Sun, (G. W. Carver); Decatur County, 1902; Keokuk, 1902 (B. Shimek); Muscatine (F. Reppert); Humboldt, 1921 (Clarence Pickard); Donnellson, 1915 (J. S. Clau); Farmington, 1920 (F. N. Jacks); Quarry, 1898 (E. R. Hodson); Steamboat Rock, 1901 (C. M. King).
Fig. 7. Awned Brome grass (*Bromus tectorum*).
Cedar Rapids, Des Moines, Newton, Iowa City, Davenport, Burlington, Creston, McGregor and Mason City. (*) Reports of its injurious properties to stock have also been received. It is a slender, erect, leafy annual, 7-25 inches high, with narrow, softly pubescent leaves, and open, nodding panicles, 3-7½ inches long; spikelets 5-8 flowered, with unequal, acuminate-pointed, hirsute, empty glumes and rough or hirsute, flowering glumes, 4-6 lines long; awns 6-8 lines long.

This grass produces injuries similar to those of squirrel-tail grass or wild barley. The awned glumes working in under the teeth cause inflammation and suppuration. Animals lose their teeth and in case of sheep the eyes become inflamed and the wool is seriously deteriorated.

The weed is easily killed by cultivation. The plants, soon after they have blossomed, should be cut or burned. The seeds ripen quite rapidly.

(*)It is represented in our collection from: Good River, 1926 (L. H.) Pammel, B. B. Zimmerman; Algona, 1926 (Frank Barker); Ames, 1926 (A. O. Simonds); Webster City, 1927 (County Agent); St. Charles, 1926 (P.G. Johnston); Washington, 1923 (H. B. Ellis); Bradgate, 1924 (V. H. Coffin); Cherokee, 1924 (L. H. and H. E. Pammel); Neola, 1918; Glidden 1918 (H. E. Jaques); St. Charles, 1918; Murray, 1918; Mount Pleasant, 1918; LeMars, 1924; Kelly, 1921; Osceola; Cordova, 1924; Commerce, 1925; Union, 1924 Ames, 1894 (C. B. Weaver); Clark, Mills County, 1918 (H. E. Jaques); Coon Rapids, 1921 (A. J. Bartsch); College Springs, 1920 (E. F. Badger; Malcolm, 1922 (Paul C. Tomilinson); Emmet County, 1922 (H. O. Wolden); Ona, 1922 (T. Mannkstad); Des Moines, 1921 (A. L. Bakke); Avoca, 1918; Malvern, 1918 (H. E. Jaques); Elkhart, 1927 (J. J. Sketor); Fort Dodge (F. W. Paige); Chickasaw County, 1926 (W. D. Spiker).