

WEED MANAGEMENT IN PASTURES

Spiny Pigweed

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The Short Story

As the common name suggests, spiny pigweed (*Amaranthus spinosus*) is armed with two spines at the base of the leaves at each node. It can often be found in pastures that are heavily grazed and in need of some attention. In pastures, spiny pigweed is a competitive weed and has been associated with nitrate accumulation in livestock.



Figure 1. Spiny pigweed is often found in heavily grazed pastures.

Mowing can suppress spiny pigweed seed production, but even beat-up plants can still occasionally produce seed. Applying products with dicamba (at a rate of 1 lb ai/A) or Crossbow® (2 to 4 qt/A) are effective at controlling spiny pigweed. Crossbow® can also be applied as a spot treatment (1-1.5% v/v).

The Rest of the Story

Spiny pigweed, also known as spiny amaranth, is one of the most common weeds seen in pastures. Cattle and horses will selectively overgraze forages to the ground, which allows spiny pigweed to populate heavily grazed pastures. Spiny pigweed resembles normal pigweed, but is armed with a pair of spines at each node (Figure 2).



Figure 2. Spiny pigweed plants have a pair of spines at each node.

Photos provided by University of Missouri Weed ID Guide, weedid.missouri.edu

Identification

See Other Images

More photos of spiny pigweed are available from:

Virginia Tech Weed Identification Guide

www.ppws.vt.edu/scott/weed_id/amasp.htm

University of Missouri Weed ID Guide

weedid.missouri.edu/weedinfo.cfm?weed_id=16

Spiny pigweed is an annual pigweed that can grow up to 5 feet tall, although we rarely see plants this tall in Indiana. Its stems and leaves are hairless and can sometimes have a reddish tinge. Leaves are alternate, oval- to egg-shaped, 1.2 to 2.4 inches long, and 1.2 to 2.4 inches wide. The two sharp spines at each node are 0.2 to 0.4 inch long.

Plants have male and female flowers (monoecious). The inflorescence is often separated — with male flowers predominantly in the terminal spike and female flowers in the axils of the stems (Figure 3). Seeds look like typical pigweed seed: small, black, and shiny.

Biology

Like other pigweeds, spiny pigweed is a competitive weed in grass pastures. Seed germination rates on the soil surface are around 56 percent. When buried only 0.2 inch, germination decreases to only 7 percent.

Germination occurs in a wide range of temperatures. Research has shown that germination ranges from 57 percent at 68°F to 79 percent at 86°F — temperatures reflect a normal 40 percent fluctuation between day and night temperatures. However, when temperatures were held constant, germination was reduced.

Left unimpeded, spiny pigweed can accumulate 1.2 pounds dry weight of plant material in a 14-week period and reach a height of 4.5 feet.

A study by B.A. Sellers, et al. (2003), indicated that these growth rates are comparable to common waterhemp and smooth pigweed, but less than Palmer and redroot pigweed, which accumulated more biomass and height in the same time frame. The study also reported that spiny pigweed could produce an average 113,960 seeds per plant.

History

Many pigweeds, including spiny pigweed, are native to the United States. In 1895, Edwin B. Uline and William L. Bray reported spiny pigweed as “spreading from South America northward through Mexico and the West Indies, throughout southern and southeastern United States north to Kansas and New England.” Charles C. Deam reported spiny pigweed in 19 Indiana counties in 1940.

In most published accounts, spiny pigweed is referred to as a weed — Uline and Bray went so far as to call it “A slovenly weed.” However, the pigweed’s virtues as a

foodstuff are well known. People often eat pigweeds. They grind the seed into a flour that is reported to have a higher nutritional value than grain flour. People in Mozambique eat spiny pigweed leaves as a wild plant foodstuff — the leaves have been reported to be a good protein source. Although considered edible, it should be noted that there are some potential problems with pigweeds.

Toxicity

Pigweeds have been associated with nitrate accumulation in livestock. It is considered potentially toxic to cattle, goats, sheep, and swine. In many reports of toxicity, redroot pigweed (*Amaranthus retroflexus*) is usually identified as the pigweed present. M.R. Aslani and M. Vojdani reported that seven cows in Iran died when they consumed redroot pigweed.

When plants were analyzed for nitrate content they measured 6.6 percent and 10.4 percent in the



Figure 3. Spiny pigweed inflorescences are often separated — with male flowers predominantly in the terminal spike and female flowers in the axils of the stems.

dry matter. In a case in Ontario, there was a 1 to 2 percent loss of lambs pastured in a field overgrown with pigweed. The animals died nine to 12 days after feeding on pigweed.

Typically, pigweeds are not palatable to animals, but they can consume pigweeds in desperate situations. Toxicity also appears to be environmentally induced, possibly increasing in drought or high fertility situations. However, L.W. Mitich stated that, “stock usually eat it without harmful effects.”

Although there are a fair number of reports showing pigweed toxicity in animals, there is very little regarding human toxicity. However, there is some reference to human allergies to pigweed species. In 2005, F.O. Orech et al., reported that when comparing other leafy vegetables consumed in Africa, *Amaranthus hybridus* (smooth pigweed) was the least toxic and proceeded to recommend its use as an edible foodstuff. We could not find any reference to the use of spiny pigweed specifically as food.

Control

Mowing can suppress spiny pigweed growth and seed production, but the plant will bounce back and complete its life cycle if mowing is not maintained. In some pastures, fairly beat-up, short spiny pigweed can still produce flowers and thus seeds. One can remove small numbers of plants with a spade or dandelion fork (a tool for cutting weeds just below the soil line). After removing weeds by hand, we recommend bagging and removing them to ensure seeds are not left in the field. Hand removal is impractical for large fields or where there are heavy infestations of the weed.

Spiny pigweed is often found in pastures that have been heavily grazed or maintained with minimum inputs. It is uncommon in healthy, vigorous pastures. Practices that promote strong, healthy pastures (such as correct soil pH, appropriate nutrient inputs, and proper rotational grazing) can suppress spiny pigweed. Many cool-season grasses require medium fertility (or better) for optimum growth.

For agronomic information regarding forages, see the *Forage Field Guide* (Purdue Extension publication ID-317), available from the Purdue Extension Education Store, www.the-education-store.com.

Several herbicides have activity on annual pigweeds in grass pastures. It is important to apply herbicides in a timely manner — applying herbicides to large spiny

pigweed plants can have disappointing results. Most herbicide labels require the products to be applied to pigweeds that are less than 4 to 6 inches tall, depending on the specific product.

Many of the growth regulator herbicides have good activity on pigweeds, providing about 80 to 90 percent control. However, growth regulators can injure or kill any legume plants in a mixed pasture. Dicamba will have more activity on pigweeds than 2,4-D. When using dicamba, use at least 1 lb ai/A; lower rates may lead to inconsistent or unsatisfactory results. Mixes of dicamba and 2,4-D can allow for reduced dicamba rates. Crossbow® broadcast at 2-4 qt/A, or spot sprayed with a 1-1.5% v/v is excellent on spiny pigweed.

In alfalfa, Balan®, Eptam®, and Prowl H2O® provide excellent pre-emergence control of annual pigweeds. Chateau®, Sencor®, Gramoxone Inteon®, Pursuit®, Raptor®, and Velpar® all have excellent activity on annual pigweeds. In alfalfa and clovers, Butyrac 200® has good activity (approximately 80-90 percent control) and can be used in the seedling year. However, although many annual pigweeds respond similarly to herbicides, spiny pigweed may not always react to herbicides the same way as smooth pigweed.

Work done specifically on spiny pigweed in alfalfa suggested that Butyrac 200® at 1 qt/A, Pursuit® at 4 oz/A, and Prowl H2O® at 3 pt/A could provide good to excellent control. Apply Prowl H2O® in spring before spiny pigweeds emerge to provide pre-emergence control. Prowl H2O® will not control emerged spiny pigweed. A Kentucky study by M.E. Edwards et al., reported that 2,4-D applied in June provided 80 percent control.

In a mixed legume and grass pasture, it is very difficult to control spiny pigweed without injuring the legume or grass component. There are very few products labeled for mixed pastures, so pasture managers often have to decide which of the two forages can be injured or lost. 2,4-D injures white clover but does not control it, so it often bounces back from an application. This herbicide is not labeled in a legume/grass mixed pasture, but if the injury or loss of the legume can be tolerated, then 2,4-D might be considered for controlling spiny pigweed.

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