

Flat-top Goldenrod (*Euthamia caroliniana*): Biology and Control in Pastures¹

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Flat-top goldenrod (*Euthamia caroliniana*) is a common weed found in pastures with low levels of management. In particular, we see this weed in pastures with low soil pH growing with companion weed species including broomsedge, blackroot (*Pterocaulon pycnostachyum*), dogfennel (*Eupatorium capillifolium*), yankeeweed (*Eupatorium compositifolium*), and thin paspalum (*Paspalum setaceum*), among others. Flat-top goldenrod is not a true goldenrod species, but it was once classified in the same genus as the commonly known goldenrod (*Solidago*) species.

Biology

Flat-top goldenrod is a perennial plant that grows to approximately 3 feet in height. Plants tend to grow in colonies and spread by both seed and a creeping rhizome root system. Leaves are alternate, extremely narrow, and similar in width and length to the leaves of dogfennel. Leaves are often shed during flowering, except near the top of the plant. Flat-top goldenrod appears as a single stem when it emerges in the spring, but the stem begins to branch as early as mid- to late May. The branches grow to produce a flat-topped appearance (Figure 1). Flowering occurs from September through November, and the flat-topped inflorescence consists of many yellow ray and disk flowers (Figure 2).



Figure 1. Flat-top goldenrod is a perennial plant that often infests poorly maintained pastures. Multiple branches give the plant a flat-top appearance.

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Identification

Flat-top goldenrod is easily confused with dogfennel early in the growing season. The easiest way to tell the two apart is to look at the stem. If the stem is hairy, succulent, and easy to break in half, it is dogfennel. If the stem is somewhat angled, nearly woody, and hard to break in half, it is more than likely flat-top goldenrod. Additionally, flat-top goldenrod tends to have a reddish color on the lower half of

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Figure 2. Flat-top goldenrod inflorescences contain many disk and ray flowers.

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the stem and becomes woody with age. Another way to tell the difference between the two species is through herbicide applications later (after June) in the growing season. While herbicides continue to control dogfennel throughout much of July, it is too late in the season to obtain any control of flat-top goldenrod. In all cases, some burn on flat-top goldenrod plants is observed, but death of the plant rarely occurs; therefore, dogfennel will be controlled, while flat-top goldenrod plants will remain virtually unchanged.

Management

Controlling flat-top goldenrod can be challenging. April applications of 2,4-D, Banvel (dicamba), dicamba + 2,4-D, or GrazonNext provided the highest level of control 90 days after treatment (DAT). However, by 365 DAT only products containing dicamba or 2,4-D provided acceptable control (>80%). This level of control was observed in two separate research trials.

Timing of herbicide application is also important. After multiple attempts, none of the commonly used pasture herbicides provided acceptable control when applied after flowering. Herbicide timing experiments have indicated that the optimum time for herbicide application is from April to June. Applications after June have rarely provided adequate control. The optimum timing for the highest level of control has always been obtained in late April to early May. If the plant has begun branching, control with herbicides will be reduced, regardless of the time of year (we have seen a couple plants begin branching as early as May). Also, keep in mind that if the soil is extremely dry, herbicide activity will be reduced slightly on flat-top goldenrod but to a lesser degree than when flat-top goldenrod begins branching. Regardless of what herbicide is used in Figure 3, a follow-up treatment will likely be necessary

within 1–2 years. It is also important to take soil samples and adjust soil pH accordingly because this plant is often seen in pastures where soil pH is low.

Take note of the pastures where flat-top goldenrod is problematic and plan for an herbicide application next spring. It would also be wise to soil sample these pastures as the soil pH is most likely lower than required for optimum forage production. If you have further questions concerning this weed, please contact your county Extension livestock agent.

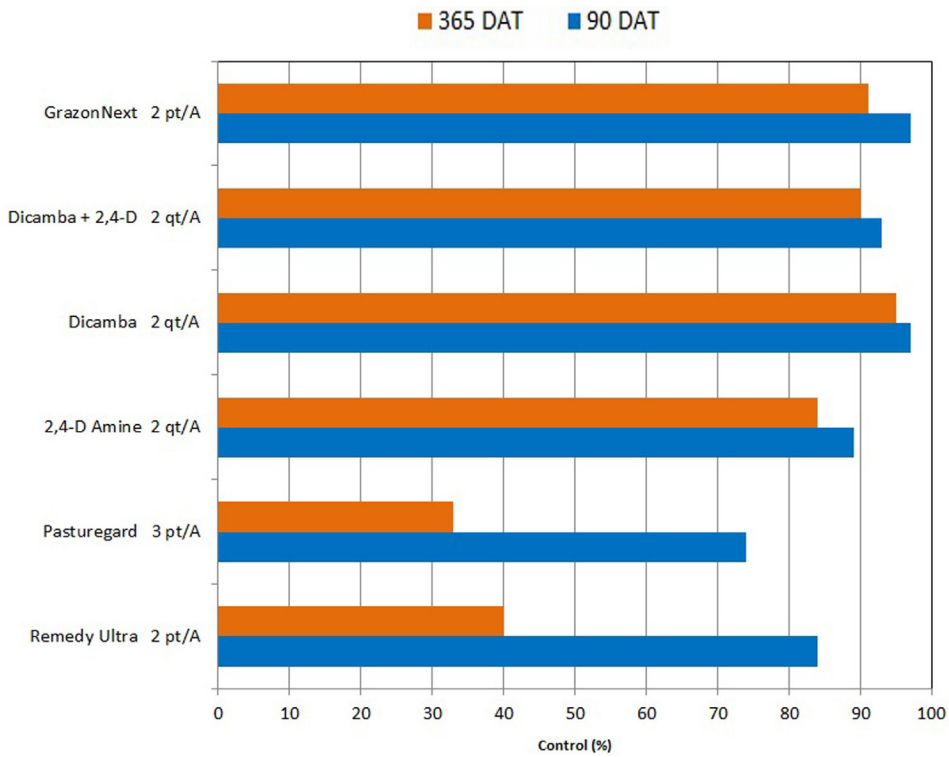


Figure 3. Control of flat-top goldenrod 90 and 365 days after a spring application. All treatments included a non-ionic surfactant at 0.25% v/v.