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Control of Common Grassy Weeds in Pastures and Hayfields

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Weeds decrease pasture and hayfield aesthetics and forage yield. Grassy weeds can be especially troublesome due to limited herbicide options. This publication will discuss weed management tactics and herbicide application techniques to control grassy weeds. Additionally, management of Johnsongrass, Japanese stiltgrass, broomsedge, and annual foxtails will be specifically discussed.

While this publication focuses on weed management, proper grazing and haying management, as well as achieving optimal soil fertility is vitally important. Herbicides alone cannot provide a substitute for proper management. Relying solely on herbicides as a weed control program will not be successful. A healthy, vigorous stand of desirable grasses is the best weed management tool. Stopping grazing or cutting hay at 4 inches in height and resting between grazing or cutting events can reduce weed densities and allow for quicker re-growth, adding up to a third more forage to be produced in a season (Renz and Schmidt 2012; Sollenberger et al. 2012). Optimizing soil fertility begins with taking routine soil tests and following the recommendations provided. Maintaining optimum soil pH increases nutrient

availability. Optimum soil pH for most cool-season grass and legume forages is 6.2 to 6.5 (Teutsch and Smith 2009).

The first step in weed control is correct identification. Virginia Cooperative Extension maintains the Virginia Weed Identification Website (https://weedid.cals.vt.edu/), which provides pictures of common weeds, descriptions, and the ability for users to identify weeds by selecting plant characteristics. The Virginia Weed Identification Clinic also provides weed identification services free of charge via your local county agent (https://www.ppws.vt.edu/extension/weedid-clinic.html).

Herbicide Application Methods

Annual Weedy Grasses

Annual weedy grasses may be controlled with preemergence or postemergence herbicides. Pendimethalin is a preemergence herbicide that can control many annual weedy grasses when applied before germination. Prowl H20 and Satellite HydroCap are two pendimethalin products with supplemental labels for this use in Virginia. Summer annual grasses, like crabgrass (*Digitaria* spp.), annual foxtails (*Setaria* spp.; discussed below), field sandbur (*Cenchrus incertus*), jointhead arthraxon (*Arthraxon hispidus*), and others can be controlled by pendimethalin. While application timing varies by region and weed species, it is recommended to apply prior to early-April. Pendimethalin will also prevent establishment of desirable grasses and legumes from seed, so do not apply pendimethalin to seeded or establishing fields.

Certain annuals grasses can be selectively controlled postemergence. Generally, the best application timing is when annual grasses are young and actively growing. Quinclorac herbicides (Facet L and Quinstar) can control crabgrasses, annual foxtails, and other grasses. Application timing is critical for success. Grasses must be within the size or growth stage listed on the product label. Including proper adjuvants according to the product label is also important.

Perennial Weedy Grasses

There are no selective herbicides that can control established perennial grasses in cool-season grass forages. Spot spraying and wiper applications are ways to achieve selectivity with a nonselective herbicide such as glyphosate. Spot spraying is accomplished by only spraying areas infested with weeds using a hand-held sprayer. Glyphosate is recommended for spot application, which will kill desirable grass and clover species that it contacts. Wipers applicators (also known as rope wick applicators) are devices that physically wipe herbicide directly onto weeds (figure 1). To achieve selectivity, there must be a height difference between weedy and desirable species. The height of the wiper is set above the desirable

Figure 1. Weed wiper applicator

species and below the weed species, so that as it moves through the field, herbicide is wiped onto the weedy species. Grazing can sometimes be used to create a height difference. Care must be taken to prevent contact of glyphosate with desirable species, as it will kill these. Wiping in two opposite directions, with sufficient drying time between, is generally more effective than a single pass. The most effective timing for herbicidal control of perennial species is when the plants are transporting sugars to their underground storage structures, during the early bloom stage or in the fall. Mowing or clipping of perennial weeds increases effectiveness of herbicides because there are fewer food reserves stored underground after regrowth. More information on spot spraying and weed wipers can be found in the forages section of the Virginia Pest Management Guide for Field Crops at http://pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/456/456-016/ENTO-239-2.pdf.

Control of Selected Troublesome Grassy Weeds

Johnsongrass

Figure 2. Johnsongrass

Johnsongrass (*Sorghum halepense*) is a perennial grass that can spread by rhizomes and seed (figure 2). Johnsongrass produces prussic acid when under stress that can poison livestock, especially ruminants. Frost, drought, and high levels of nitrogen fertilization with low levels of phosphorus and potassium increase stress and thus prussic acid in Johnsongrass (Comerford 2012). Controlling Johnsongrass in hayfields can be difficult and take multiple years due to its large root structure and ability to sprout from rhizomes.

Johnsongrass can be controlled by frequent, low cutting; however, monthly cutting is not economical. Hay cutting is not sufficient to control Johnsongrass. Grazing can control Johnsongrass in two to three seasons, but grazing should be avoided directly after the plant has been under stress. Spot spraying or using a wiper to apply glyphosate provides good control of Johnsongrass, but multiple applications over multiple years may be required. There are currently no selective herbicides for Johnsongrass control in cool-season grass forages. Rotating to row crops such as corn may be an option in heavily infested fields (Flessner and Cahoon 2018).

Japanese Stiltgrass

Japanese stiltgrass (*Microstegium vimineum*) is a summer annual that thrives in moist, shady areas (figure 3). Most livestock and wildlife will not graze the grass, so it is often left alone to outcompete desired grass species. Stiltgrass should be aggressively controlled when it first invades a field to prevent establishment (Neal and Judge 2013).

Figue 3. Japanese stiltgrass

Spot spraying glyphosate is highly effective at controlling stiltgrass, but it does not provide long-lasting control and will also control desirable grasses. Herbicides containing aminopyralid, such as Chaparral, Milestone, and GrazonNext HL, are fairly effective at controlling stiltgrass (Table 1). Stiltgrass is best controlled when plants reach 3 to 5 inches in height, which generally occurs in late May to June.

Species	2,4-D[1] 2–3 pt	2,4-D + dicamba[1] 1 qt + 1 pt	Aim 1–2 oz	Chaparral[1] 2–3 oz (PA,VA,WV)	dicamba[1] 1 pt	Crossbow[1] 2–4 qt	GrazonNext HL[1] 1.5–2.6 pt (PA,VA,WV)	Grazon P+D[1] 3-4 pt (VA,WV)	Metsulfuron 60DF 0.1–0.3oz	Milestone 5-7 oz (PA,VA,WV)	Overdrive 4–6 oz	Pasture-Gard HL[1] 1-1.5 pt	Remedy Ultra 2-4 pt	Roundup/glyphosate 1–2 qt (spot treatment)	Stinger 0.66–1.33 pt	Surmount[1] 1.5-3 pt (VA, WV)
Stiltgrass, Japanese	N	N	N	8	N	N	7	–	N	7	–	–	N	**10**	N	N

Table 1. Relative Effectiveness of Herbicides for Japanese Stiltgrass Control in Pastures and Hayfields. Control ratings: 10 = 95-100%; 9 = 85-95%; 8 = 75-85%; 7 = 65-75%; 6 = 55-65%; N = less than 55%; – = not applicable. (Flessner and Cahoon, 2018).

Broomsedge

Broomsedge (*Andropogon virginicus*) is a perennial grass that often goes unnoticed until it turns reddish brown and forms broom-like leaves (figure 4 & 5). Poor nutritional quality and palatability make broomsedge an undesirable forage. Broomsedge is an indicator of low fertility and phosphorus deficiencies in soil (Brakie 2009). As soils become more acidic, phosphorus becomes less available, so maintaining a soil pH above 6.0 can increase

Figure 4. broomsedge (dormant)

available phosphorus. Broomsedge requires less phosphorus than other grass species so it is able to outcompete desired grass species in unfertile soils.

At optimum nutrient levels and pH, tall fescue and other grass forages increase in density and will outcompete broomsedge. It may take multiple years to completely control (Peters and Lowance 1974). For established broomsedge, spot spraying or using a wiper to apply glyphosate when broomsedge is actively growing provides good control.

Figure 5. broomsedge (actively growing)

Foxtails

Figure 6. yellow foxtail

Figure 7. green foxtail

Figure 8. giant foxtail

Yellow (*Setaria pumila*) (figure 6), green (*Setaria viridis*) (figure 7), and giant foxtail (*Setaria faberi*) (figure 8) are all summer annuals, while knotroot foxtail (*Setaria parviflora*) (figure 9) is a warm-season perennial. The hair like barbs on foxtail seed heads can cause mouth ulcers in horses and other livestock. These ulcers lead to reduced weight


Figure 9. knotroot foxtail (McCullough 2016)

gain and decline of animal health. The easiest way to identify knotroot foxtail from annual foxtails is to pull up the plant and examine the roots. Knotroot foxtail has rhizomes and knot looking roots, while annual foxtails have fibrous roots (McCullough 2016). Established knotroot foxtail also produces a seedhead much earlier in the year (June) than annual foxtails (August to September).

Improving competiveness of desired pasture species can suppress foxtail species. Annual foxtails germinate in spring when soil temperatures reach 60º F. Nitrogen fertilization should be reduced during foxtail germination to reduce seedling survival. Excessive nitrogen can also promote seed head production and seed spread, so it should be avoided in fields with heavy foxtail pressure (McCullough 2016).

Pendimethalin (Prowl H2O and Satellite HydroCap) and quinclorac (Facet L and Quinstar) can be used to control annual foxtails. Facet L at 32 fl oz/A + methylated seed oil at 1% v/v is most effective when applied 5 to 10 days after the first hay cutting. Quinclorac has the potential to injure orchardgrass under stress, so it is not recommended to apply during temperature or drought stress. Pendimethalin (Prowl H2O or Satellite HydroCap) at 2.1 to 3 qt/A is most effective when applied as a preemergence application. It should be applied in April before annual foxtails emerge. Prowl H2O can be applied in split applications during the spring and again between cuttings, but applications must be at least 30 days apart and no more than 4.2 qt/A can be applied in a given year. Pendimethalin generally provides about 4 to 6 weeks of weed control per quart applied if effectively incorporated into the soil. Prowl H2O applied preemergence early in the season followed by a postemergence application of Facet L or Facet L

alone applied later in the season, after the first hay cutting, provides approximately 75% control (Flessner et al. 2017).

Established knotroot foxtail is not controlled by pendimethalin or quinclorac as it emerges from a rhizome. Spot spraying with glyphosate is effective at controlling knotroot foxtail when it is actively growing. It is recommended to make applications prior to seed production (Flessner and Cahoon 2018). Fields heavily infested with knotroot foxtail may require renovation or rotation out of forage.

For more information, please consult the Virginia Pest Management Guide for Field Crops (http://pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/456/456-016/ENTO-239-2.pdf) or the Mid-Atlantic Weed Management Guide (https://extension.psu.edu/mid-atlantic-field-crop-weed-management-guide).

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