

# Targeted Control of Buttercup, Buckhorn Plantain and Thistles in Forage Systems

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Weeds in pastures reduce forage yield through competition for water, nutrients and light. Moreover, weeds can reduce forage nutritional quality, resulting in decreased animal intake and performance. Weed occurrence in pasture can be attributed to several factors, including poor forage establishment, environmental conditions (e.g., drought, high temperatures, etc.) and management practices such as overgrazing, lack of fertilization and frequent burning.

Using herbicides is often the first step taken to keep weeds out of pastures and hayfields; however, it's just as important to soil test and fine-tune your grazing practices. Good pasture management combined with chemical control builds a stronger, more resilient grazing system in the long run, rather than just reducing weeds in the short term.

The first and most important step in weed control is knowing exactly what you're dealing with, as some herbicides are more effective than others on certain weeds. Identifying weeds before they bloom can be tricky, but it's key to choosing the right control method. There are many apps like PI@ntNet™, PictureThis®, iNaturalist® and Google Lens® to assist with weed identification. Capturing clear pictures and consulting your county Extension agent ensures accurate identification and specific guidance for your field before taking action.

There aren't many effective options for controlling grassy weeds in cool-season grass pastures. Most forage producers concentrate on managing broadleaf weeds. Auxin herbicides, like 2,4-D, are well-known for their ability to control a wide range of broadleaf weeds without harming the grasses. These herbicides mimic natural plant hormones, causing rapid, uncontrolled growth that leads to twisted stems and plant death. However, they can also damage desirable forage legumes like clovers, so careful application is essential when those are part of the pasture mix.

For best results, weeds should be **small** and actively growing when herbicides are applied. Waiting until weeds are flowering results in poor control because the plant has shifted its energy to seed production rather than actively growing. Most cool-season weeds sprout in the fall and bloom in late April or May. Start scouting for cool-season weeds in November (Table 1) and plan to spray between November and March. For best results, apply in a window of at least three consecutive days with daytime temperatures above 60 F, ensuring the weeds are actively growing and able to take up the herbicide effectively (Israel & Rhodes, 2015a). Often, the best months to apply herbicides for cool-season weed control are November and December. It is often easier to find consecutive days of 60 F temperatures during these months than later in the winter.

**Table 1. Cool-Season Weed Control in Forage Systems**

Activity	Winter					Spring		
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Scouting for cool-season weeds	Yellow	Green	Green	Green	Green	Green	Yellow	Red
Controlling cool-season weeds	Yellow	Yellow	Green	Green	Green	Green	Yellow	Red

Yellow = Marginal months; Green = Best months; and Red = Not recommended.

In Tennessee, three common cool-season broadleaf weeds often found in pastures and hayfields are **buckhorn plantain** (*Plantago lanceolata*), **buttercups** (*Ranunculus spp.*) and **thistles**, specifically bull thistle (*Cirsium vulgare*) and musk thistle (*Carduus nutans*). Below is a more detailed description of each to aid in identification, along with information on their toxicity potential and recommended control measures.

It is always important to note that some herbicides mentioned in this publication are not recommended for use in certain Tennessee counties or have grazing and haying restrictions. Always check the herbicide label. While other herbicide options are listed in **UT Extension Publication PB1580 Weed Control Manual for Tennessee**, this publication summarizes those with higher effectiveness in controlling the listed weeds. Ensure the spraying equipment is properly calibrated before use and environmental conditions are optimal. For more information on spray calibration, see **UT Extension Publication W315, A Simple Method to Calibrate Sprayers**.

**Buckhorn plantain** (*Plantago lanceolata* L.)



**Figure 1:** Buckhorn plantain rosette (Photo: Roger Furlan)



**Figure 2:** Buckhorn plantain flowering (Photo: Roger Furlan)

**Description:** Cool-season perennial plant that frequently responds as an annual. This weed's leaves are linear with parallel veins. Older leaves are linear to lanceolate, forming a basal rosette (Fig. 1), and may be smooth or pubescent (hairy). Leaves are 2 to 12 inches long, and mature plants with seed heads (Fig. 2) can be up to 2 feet tall.

**Toxicity:** Buckhorn plantain is not toxic to livestock but competes with desirable forages for nutrients, water and light.

**Control:** Due to the basal rosette growth habit, leaves often escape from mowing and grazing. Herbicides are more effective before flowering.

Herbicide	Rate
2,4-D Ester*	2 qts/ac
DuraCor* (Aminopyralid + florasulam-benzyl)	12 fl oz/ac
Range Star/Weedmaster* (Dicamba + 2,4-D Amine)	1-4 pts/ac
GrazonNext HL* (Aminopyralid + 2,4-D)	1.5-2.1 pts/ac
NovaGraz** (2,4-D + florasulam-benzyl)	1.5-3 pts/ac

\*Add 0.25% v/v Nonionic surfactant (1 qt./100 gal) of spray mix

\*\* Add 1% v/v methylated seed oil adjuvant (1 gal/100 gal) of spray mix

**Buttercups (*Ranunculus* spp.)**



**Figure 3:** Buttercup in a vegetative state (Photo: Roger Furlan)



**Figure 4:** Flowering buttercup (Photo: Roger Furlan)

**Description:** Cool-season annual plant. It grows from basal rosettes that germinate in late fall and continues growing throughout winter. Leaves are palmately 3-lobed, 0.75 to 2 inches long and wide, and alternate along the stem. Stems are erect and branch from a basal rosette and can reach heights of 24 inches. Leaves and stems may be glabrous (without hairs) or pubescent. Distinctive yellow flowers are 0.5 to 1 inches wide with five petals (Fig. 3).

**Toxicity:** The oil protoanemonin, which is present in buttercup species, might cause livestock oral and gastrointestinal irritation. The largest concentrations of toxicity are found in the leaves and stems of flowering plants. Although rare, poisoning can happen when there is a forage shortage. Dry hay does not present toxicity since the oil volatilizes quickly (Israel & Rhodes, 2015b).

**Control:** Herbicide applications should be made prior to flowering for best results (Fig. 4). Lower use rates can be applied when plants are shorter than 6 inches.

Herbicide	Rate
2,4-D Ester*	2 qts/ac
DuraCor* (Aminopyralid + floryprauxifen-benzyl)	12 fl oz/ac
Range Star/Weedmaster* (Dicamba + 2,4-D Amine)	1-3 pts/ac
GrazonNext HL* (Aminopyralid + 2,4-D)	1.5-2.1 pts/ac
NovaGraz** (2,4-D + floryprauxifen-benzyl)	1.5-3 pts/ac

\*Add 0.25% v/v Nonionic surfactant (1 qt./100 gal) of spray mix

\*\* Add 1% v/v methylated seed oil adjuvant (1 gal/100 gal) of spray mix

**Thistle: bull and musk (*Cirsium vulgare* (Savi) Ten.; *Carduus nutans* L.)**



**Figure 5:** Bull Thistle rosette (Photo: Roger Furlan)



**Figure 6:** Thistle flower (Photo: David McIntosh)

**Description:** Cool-season biennial plants. Forms a rosette (Fig. 5) of spiny leaves 5 to 15 inches long and 2 to 5 inches wide close to the soil, with an erect, spiny stem 1 to 5 feet tall. When mature, flowers are pink (Fig 6.) with spiny-tipped bracts. Musk thistle has smooth and shiny leaves with spines, while bull thistle has hairy and rough leaves with spines

**Toxicity:** Can be associated with nitrate accumulation, and spines may cause mechanical injury.

**Control:** Due to the basal rosette growth habit, thistles often escape mowing. Late fall and early winter applications result in higher control. Use higher herbicide rate for larger and flowering plants.

Herbicide	Rate
2,4-D Ester*	2 qts/ac
DuraCor* (Aminopyralid + floryprauxifen-benzyl)	12 fl oz/ac
Range Star/Weedmaster* (Dicamba + 2,4-D Amine)	1-3 pts/ac
GrazonNext HL* (Aminopyralid + 2,4-D)	1.2-1.5 pts/ac
NovaGraz** (2,4-D + floryprauxifen-benzyl)	1.5-3 pts/ac

\*Add 0.25% v/v Nonionic surfactant (1 qt./100 gal) of spray mix

\*\* Add 1% v/v methylated seed oil adjuvant (1 gal/100 gal) of spray mix



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