

## Thistle Control in Pastures<sup>1</sup>

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Brent Sellers, Jason Ferrell and Curtis Rainbolt<sup>2</sup>

If left uncontrolled, thick thistle stands can reduce grazing, result in less forage production, and ultimately, lower calf weaning weight. A single thistle plant can produce at least 4,000 seeds, which increases the chance for higher thistle populations in the pasture the following year. Consequently, management practices need to be conducted prior to flower formation for effective thistle control. Even if thistles have not infested your pasture in the past, it is ideal that your pastures are scouted in late fall through mid-spring to ensure that thistles do not get out of control. New infestations are easier to manage than large-scale populations.

Although there are at least nine different species of thistle in Florida, most are closely related and control recommendations will not differ. While scouting, you may encounter tall thistle, Lecontes thistle, swamp thistle, Nutalls thistle, purple or yellow thistle, bull thistle, Virginia thistle, and possibly others. See the identification key (Table 1) if you are interested in identifying a particular species.

### Biology and Control

All thistles mentioned above are biennials, with the exception of Lecontes thistle, which is a perennial. Biennial plants are those that grow from seed in one year and produce seeds the second year. There are 3 distinct life stages that pertain to management of thistle. During the first year, the plant will grow as a rosette (a taproot with a cluster of leaves on or near the soil surface) (Figure 1). During the second year, a stalk elongates (which is often referred to as bolting) from the rosette (Figure 2). The plant then flowers, produces seed, and dies. In Florida, the rosette growth stage occurs primarily during the winter months. Bolting occurs from late January through July, and flowering occurs from April through August. The variation of growth among individual thistle plants can make control a daunting task.

### Mechanical control

Preventing seed production is of utmost importance when attempting to manage thistle populations. Little can be done to effectively manage these plants if allowed to flower and produce seed

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  2. Brent Sellers, assistant professor, Range Cattle Research and Education Center--Ona, FL; Jason Ferrell, assistant professor, Agronomy Department; Curtis Rainbolt, assistant professor, Everglades Research and Education Center--Belle Glade, FL; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

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**Figure 1.** Example of a thistle rosette.



**Figure 2.** Example of thistles at the bolting growth stage prior to flowering.

before control occurs. While not very practical, rosettes can be manually removed by hand when small by cutting the plant below the soil surface to prevent regrowth. This is time-consuming and only effective on very small infestations. Mowing thistles can be an effective strategy, but timing is critical. Clipping thistles later in the spring (April to June) is quite effective when the flower stalk is typically hollow (late bolting stage). The plant is not likely to regrow or produce seed if mowed at this time. However, mowing when plants are in the rosette stage (prior to flower stalk formation – bolting) is not effective and plants will regrow. Therefore, mow only after rosettes have bolted, but before flowers are formed. Not to discourage mowing, but timing a mowing treatment can be difficult, since all thistles do not bloom at the same time. Finally, rising fuel costs may make mowing a uneconomic thistle control method, especially when multiple mowing treatments may be required for effective control.

## Chemical control

Herbicides are often the most flexible and affordable option for thistle control in pastures. However, like mowing, timing is an important factor for many herbicides. Several commonly used pasture herbicides are highly effective on thistles, if applied early in the growing season (Table 2). Thistles in the rosette state are highly sensitive to herbicides and are easily controlled. However, delaying the application until after bolting can have a dramatic impact on effectiveness, particularly with Cimarron. When applied at flowering, all herbicides provide less than 90% control, except for Milestone. In this case, using a herbicide may or may not be warranted, as they can provide short-term control but will not be effective in long-term management. Yes, Milestone will control flowering thistle, but if seeds are already produced and the plant is beginning to die, mowing may be the best (temporary) option.

The importance of application timing cannot be over-stated. Thistles are normally not visually evident as a problem until flowers are produced. However, the plants are there in the rosette form long before flowers emerge, and early scouting should allow early detection and optimum control. Quickly scouting the pastures in late winter (January to March) will reveal the presence of thistles (rosette stage) and allow for an inexpensive herbicide application. If you wait until thistles flower, mowing and/or herbicide options are limited, less effective, and more expensive. Take the time to scout early, because it is the key to better and more economical thistle control.

## References

Wunderlin, R. P. and B. F. Hansen. 2003. Guide to the vascular plants of Florida. 2nd Ed. Gainesville: University Press of Florida.

**Table 1.** Identification Key (Adapted from *Guide to Vascular Plants of Florida*).

1. Brown stemmed plants, with stems densely covered with long, soft hairs (mainly found in North Florida)	Blessed thistle ( <i>Cnicus benedictus</i> )
1. Green stemmed plants	
2. Stems winged with spiny leaf bases that extend downward	
3. Stems and leaves covered with dense hairs giving the plant a felt-like appearance (rare)	Scotch cottonthistle ( <i>Onopordum acanthium</i> )
3. Stems and leaves coarse with sharp, long spines. Sometimes with sparse hairs on upper and lower leaves	Bull thistle ( <i>Cirsium vulgare</i> )
2. Stems with or without wings, with leaf bases that extend downward	
4. A secondary set of spiny bracts is present under the flowerhead (found throughout Florida)	Horrible thistle ( <i>Cirsium horridulum</i> )
4. A secondary set of spiny bracts is not present under the flowerhead.	
5. Primary bract on flowerhead lacking an apical spine or with a vestigial spicule about 0.5 mm long (rare)	Swamp Thistle ( <i>Cirsium muticum</i> )
5. Middle and outer primary bracts tipped with an evident spine approximately 1 mm long.	
6. Lower leaf surface densely hairy	
7. Series of bracts (involucre) 1.5-2.5 cm high, with individual bracts secreting a sticky substance on the central ridge (rare)	Virginia thistle ( <i>Cirsium virginianum</i> )
7. Series of bracts (involucre) 2-4 cm high, with individual bracts not secreting a sticky substance (rare)	Tall thistle ( <i>Cirsium atissimum</i> )
6. Lower leaf surface with sparse hairs or lacking hairs.	
8. Plant usually with much branching when flowering (found throughout)	Nuttall's thistle ( <i>Cirsium nuttallii</i> )
8. Plant unbranched or with only a few branches when flowering (found occasionally)	Leconte's thistle ( <i>Cirsium lecontei</i> )

**Table 2.** Control of thistle at three growth-stages with common pasture herbicides.

Herbicide	Rate	\$/A <sup>a</sup>	Thistle Growth Stage		
			Rosette <sup>b</sup>	Bolting <sup>c</sup>	Flowering
2,4-D	2 qt/A	6	90	85	40
Cimarron <sup>d</sup>	0.3 oz/A	7	90	40	40
Weedmaster	2 pt/A	6	95	90	55
Remedy	2 pt/A	21	95	90	75
Pasturegard	3 pt/A	18	95	90	70
Milestone	4 oz/A	11	99	95	90

<sup>a</sup> Approximate herbicide costs.  
<sup>b</sup> The rosette stage is when the thistle forms a low-growing ring of leaves.  
<sup>c</sup> The bolting stage is when the thistle forms a stalk and prepares to flower.  
<sup>d</sup> For use in bermudagrass only.