



Chemical-free Weed Control in Pastures and Hay Fields

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Each season, we field lots of questions about which herbicides should be used to control pasture and hay field weeds such as thistles, or milkweed, or yellow rattle, or jimsonweed, or horseweed, or goldenrod, or... Well, you name the weed, it comes up in pasture and hay field conversations. Now, there are plenty of herbicides available that may well control each one of these weed problems, but rarely without also causing collateral damage to desirable forage legume species. Most herbicides for hay or pasture come with restrictions on the interval between application and when the field may be grazed or cut for hay from just a few days to one full season. There's another way, and I'd argue an easier way, to control all of these species at once, while also protecting your desirable legume species, and therefore the feed value of your forage stand.

Mowing.

Pasture weeds can be controlled very thoroughly by mowing after animals have grazed. Mowing pasture may seem counterproductive, but it's actually a very productive practice. Paddocks and pastures can become weedy when animals eat desirable plants, leaving behind plant species that are unpalatable, such as thistles or burdock. If left as is, those undesirable species have a competitive advantage over all the good species that were grazed. Overgrazing greatly worsens this effect. In the long term, the pasture weed species thrive and can spread while the good grasses and legumes have to spend root reserves to regrow. Weeds can shade grasses and legumes further impeding their growth. In the case of overgrazing, desirable grasses and legumes can be forced right out of the stand, in favor of weeds and undesirable plants. Mowing behind the animals is a good approach for keeping pasture weeds to a tiny minimum. Many weed species do not tolerate mowing, while desirable grasses and legumes respond well to mowing a few times per year. Mowing just once per year will not be as effective as mowing twice, timed to clip weed species before they mature and disperse seed. And, if you skip a year, the weeds will probably increase again, until regular mowing is resumed. Mowing regularly also benefits desirable grasses and legumes by removing mature stems and seedheads from the stand. Animals don't generally want to eat those anyway. Clipping the mature stems encourages new growth. Keep the mower high, no shorter than 6-8" off the ground, for best results.



Well-managed grass pasture at the Extension Learning Farm in Canton, NY. (photo by K. O'Neil, 2015)

Thistles, burdock and milkweeds are 3 troublesome weed types commonly found in sheep, cattle and horse pastures and each can be controlled with mowing. We deal with two types of thistles in NNY – Canada thistle and bull thistle. Bull thistle (*Cirsium vulgare*) is a biennial, meaning it needs two growing seasons to mature and produce seed. In its first year, the bull thistle grows from seed and produces a deep taproot and a short 'rosette' above ground in late summer and early fall. Mowing will not affect the rosette as it stays beneath the knives. In its second year, bull thistles send up a tall,

flowering stem. Mowing after buds and flowers are formed but before mature seed is produced is ideal for the best control of bull thistles. Bull thistles generally flower only once. Because of its biennial habit, 2 or 3 seasons of mowing are required to see a reduction in bull thistle numbers. Common burdock (*Arctium minus*) is also a biennial. It generally matures in late summer and spreads only by seed, so well-timed mowing is very effective for control.

Canada thistles (*Cirsium arvense*) are a little different, but a similar mowing strategy will work. Canada thistles are perennial and spread by seed and with a creeping root system. You'll notice that, unlike bull thistles that are often solitary plants, Canada thistles occur in patches or colonies with many plants in one small area. Once Canada thistles become established, a few years of mowing is required to get them under control. The most effective strategy for reducing this thistle is to mow a few times per season with the goal of depleting the energy reserves stored in its creeping perennial root system. Mow infested areas when the thistles produce flower buds. Because they're perennial and have larger, well-established root systems, the Canada thistles will regrow and produce another crop of flower buds – so mow them again. Mow each time they produce flower buds (which could be 3-4 times per season) and, after a few seasons, Canada thistle numbers will drop dramatically. Common milkweed (*Asclepias syriaca*) is also a perennial and spreads by underground stems. The same mowing strategy will work to control milkweed, but it may challenge your faith. Mowing may appear, initially, to make milkweeds worse, but that's simply their strategy to try and survive clipping treatment. Mowing persistently at the opportune times will reduce its numbers and spread. With both Canada thistles and burdock, timing and persistence are critical.

Hay fields can respond to mowing as well. By definition, hay fields are mowed at least once per year, right? But some hay fields can become weedy if that first mowing is delayed until July or later. Many early season hay field weeds have plenty of time to fully mature and go to seed if the field is not cut until mid- to late summer. After a few seasons of late first cutting, some weeds can begin to dominate the stand. One example of such a problem weed in late-cut hay fields is yellow rattle (*Rhinanthus crista-galli* L), which is a worsening problem in several areas in NNY. Yellow rattle is an annual parasitic plant, attacking grass roots to acquire some of its nutrients. Heavy infestations of yellow rattle can wipe out a hay field. This weed can become a much larger problem in fields where first cutting is not mowed until late June or July or even August. Optimal first cutting time is late May or June 1. Yellow rattle generally does not become well established in fields cut at this time as it disrupts seed production and survival of this species. Some good news about yellow rattle – despite its devastating effect, it can be eradicated with just a couple of years of earlier mowing as it appears its seeds are short-lived in the soil.

One important topic to investigate whenever trying to reduce a pasture or hay field weed problem is soil fertility. A low pH or insufficient nutrients can lead to or exacerbate a weed problem too and should be ruled out or addressed as one of the first steps toward a solution.

Additional resources:

1. Uva, R; J. Neal and J. DiTommaso. 1997. Weeds of the Northeast. Cornell University Press, Ithaca, NY, USA.
2. 2015 Cornell Guide for Integrated Field Crop Management. Edited by W. Cox. Ithaca, NY: Cornell University Cooperative Extension.
3. Curran, W and D. Lingenfelter, 2009. [Weed Management in Pasture Systems](#). Penn State Extension.
4. Eaton, A. et al, 2013. [Yellow Rattle: A Grass-attacking Weed in New Hampshire Hay Fields](#). Univ. New Hampshire Extension.

For more information about field crop and soil management, contact your local Cornell Cooperative Extension office or NNY Cornell University Cooperative Extension Regional Field Crops and Soils Specialists, Mike Hunter and Kitty O'Neil.

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