



Integrated Weed Management in Pastures

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Agronomists will tell you that weeds are never the problem, but only a symptom of underlying problems. Weeds invade when they have opportunities. Maintaining a thick, healthy stand that competes well with unwanted species is one of the best weed prevention tactics. The growth rate of a forage is one of the best predictors of its response to weed pressure. If it's a grass, tillering or creeping potential is another.

If your pasture is thinning enough to allow weeds in, stop to ask why. Is it a result of poor fertility? Low pH? Is the stand just old? Does it have a history of disturbance (for example, erosion, compaction, or overgrazing)? Annual weeds are often the first weed expression after a disturbance. When soil pH reaches below 6.0, weeds are favored over forage species.

Keep in mind that the most important and effective weed control takes place before planting. Start with a clean seedbed, using either burndown or full tillage. If weed seedlings have an advantage from the start, they will compete with the forage seeding for resources, and may harbor insects and pathogens. Some weeds, if not controlled before planting, can persist for many years, such as quackgrass, dandelion, Canada thistle, and curly dock. Pre-plant control will be your best investment in weed control throughout the life of your stand.

Weed or Forage?

Many plants that are considered weeds in row crops can be excellent forages, high in protein and fiber digestibility at bud stage, and often mineral content as well. Dandelions, for example, have a deep tap root and are excellent mineral scavengers. Forbs and grasses love nitrogen, which makes most of them high protein at the proper maturity (pre-heading or bolting). It's best to focus on eradicating weeds with low nutritional quality, such as thistles and goldenrod. Bridge the gap between the weeds as forage and total weed eradication with livestock impact. Dandelions, though excellent quality, are not a suitable forage because of its low yields. It can be controlled by grazing, but its growth should not necessarily be promoted, but rather accepted and eventually eradicated using livestock (or other means) and then replaced with more productive forage.

Weeds present a problem when they start invading the pasture and livestock will not graze them. The more animals are exposed to a wide range of plants, the more they will be willing to eat new weed species. They can be acclimated and forced to graze with more aggressive fencing and higher stocking densities, but you may sacrifice productivity trying to use grazing management alone. Weeds may not have the nutritional balance you are looking for and also displace the intentional species composition that is likely higher in dry matter yield.

Livestock with lower nutritional requirements, such as mature cows, can be used to pressure some areas more and eliminate weeds before they reproduce a seed or continue to spread. While grazing them out is a good option, spot mowing may be necessary to control highly invasive or toxic weeds absolutely avoid.

Understand weed life cycles

Biennial and perennial weeds will present more challenges than annuals. Perennial rooting structures are hardy and can withstand the occasional mowing and grazing. Especially challenging are those that reproduce by underground rhizomes or branching roots, such as ironweed, Canada thistle, and multiflora rose.

Biennial weeds establish in areas of low soil disturbance and need two years to complete their life cycle. The first year is vegetative growth, and they set seed the following year. The settings where they thrive include waterways, pastures, hay crops, and fence rows. They are usually destroyed by plowing.

Perennial weeds live for more than two years, and reproduce by vegetative means (rhizomes, tubers, bulbs, budding roots) as well as through seed. Their root carbohydrate reserves can eventually be depleted with frequent mowing or grazing.

Annuals grow and set seed in the same season. These include summer annuals, such as pigweed and lambsquarter, and winter annuals, such as chickweed and henbit. The major challenge with annuals is mowing or grazing them before they set seed. They will have to be managed more aggressively when their lifecycles get out of sync with the perennial pasture production and they start producing seed and becoming too mature by the time you want to graze or harvest the forage.

There are a variety of **toxic weed species** to watch out for as well, such as poison hemlock, white snakeroot, black locust, milkweeds, and nightshade species. Consult with your county Cooperative Extension service for a complete list of the species to watch out for in your area.

Weed prevention measures

- Time your planting so that you plant pastures earlier in the spring than summer annual weeds germinate, and/or earlier in the late summer (prior to September in much of Mid-Atlantic region, prior to the end of September in the Southeast region). If summer annual crops were in the field the year before, summer annual weeds may now be more of a problem (because these weeds have had a chance to establish in a crop that fits their lifecycle), so it will be best to wait until late summer to seed the pasture.
- Before planting, use proper seedbed preparation including pre-plant weed control, fertility (use a soil test as a guide to fertilization), plant at higher population densities, and use high quality seed with as little weed seed contamination as possible.
- Monitor pastures for newly introduced weeds, and aggressively eradicate them before they become a problem. Exotic weeds can be introduced to pastures through wind, flooding, birds, imported feed and hay, and manure from purchased livestock. It is most common for new weed species to be introduced through purchased hay.

- An isolation protocol for newly introduced animals is another good prevention and biosecurity tactic. Weed seeds can transfer in manure.
- Take steps to improve soil fertility before you consider reseeding or renovation (if the stand is still relatively thick) to improve stand density and competitiveness.
- Interseeding and renovation are good strategies to boost species diversity in the pasture – another key to improving stand competitiveness against weeds.
- Diversity in livestock helps too. Using only one livestock species under the same continuous grazing management is more likely to lead to undesirable plant species in the pasture. Grazing only cattle reduces grass growth over time and promotes forbs and shrubs, while sheep prefer broadleaves. Sheep are good at controlling Canada thistle, especially in the spring when shoots are young and tender. Goats control spiny, prickly weed species and brush. They like flowering thistle plants but are not attracted to vegetative thistle.
- Mowing 2-4 times a year (before flowering – some seeds may be viable just after flowering) helps deplete root and vegetative reserves. Mow after stem elongation – the plant's weakest point is at initial bud stage. A few repeated mowings keep the plant stressed. A good example of this is Canada thistle. Biennials and annuals should be mowed after bolting but before seed set.
- Termination of the stand and complete renovation with annual forages, including a cycle of cool season (such as small grains) and warm season forages (such as brassicas, millet, and BMR sorghums/sudangrasses). These crops are highly productive and high in quality. This break in the rotation helps alleviate compaction and perennial weed problems, and is especially appropriate if weeds make up 50 percent or more of the stand.

Primary reference: Presentation on Sustainable Weed Management, Sid Bosworth (University of Vermont), at the 2015 Appalachian Grazing Conference, Morgantown, WV.