



Improving Pastures and Hayfields

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Photo: Steve Turaj

Some pastures and hayfields that need improvement aren't well suited to conventional renovation. A pasture may be too steep or too rocky for conventional tillage operations or a hayfield so "bony" that tilling it would turn up many rocks that you'd have to remove before harrowing and reseeding.

By adjusting soil pH and fertility, managing weeds, and if necessary, reintroducing desirable forage species, you can often make such areas productive again without plowing and reseeding.

Your goals for your pastures and hayfields dictate what measures you will take. Before making any improvements, consider how you intend to use the land. A pasture that must meet all the forage needs for animals requires different treatment than one used primarily as an exercise yard, for example. You'll also need to evaluate the field to determine its current condition and decide how much improvement it needs. Some fields may require complete renovation and reseeding, while others may require something less involved. Finally, consider what resources—equipment, money, and time—you have available to devote to the project.

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Soil pH and fertility

To remain productive, a forage stand needs a soil environment where forage plants can thrive. Most plant nutrients become available in optimal amounts in soils with a pH range of 6.0-7.0. Most grasses and clovers do well in soils with a pH between 6.0 and 6.5, while other legumes such as birdsfoot trefoil or alfalfa require a soil pH of 6.5 to 7.0.

To support plant growth, plant nutrients must be present in adequate amounts. Any nutrient deficiencies will compromise the success of the stand. In particular, new seedlings require sufficient levels of available phosphorus and potassium to get established.

A soil test is the best way to determine the fertility of your pastures or hayfields. Follow recommendations closely and make any necessary corrections well in advance of any reseeding. If you need to raise soil pH, remember that lime moves down through the soil profile slowly, and it may take as long as a year before you see any response. Broadcast manure or fertilizer in spring or summer to apply nutrients without disturbing the existing sod.

Soil test forms are available from the UNH Cooperative Extension office in your county, or from the UNH Cooperative Extension website at <https://extension.unh.edu/Problem-Diagnosis-and-Testing-Services/Soil-Testing>

Weed management

Weeds are often low in nutritive value, and may crowd out more desirable forage plants. Some weed species are poisonous to livestock. Therefore, any plan to renovate forage stands needs to include weed management.

Many weed species cannot withstand repeated cutting throughout the growing season, so you can control these with more intensive grazing or more frequent mowing. Improving soil fertility will promote vigorous growth of desirable forage species, enabling them to compete successfully against weeds. Some weed species, such as Canada thistle and bedstraw, are more persistent and may require herbicide treatments to eliminate them from pastures or hayfields.

Introducing desirable species

Correcting deficiencies in soil fertility and eliminating weeds is often enough to bring a neglected stand back into production. However, sometimes you need to reseed in order to establish desirable species. There are several reseeding techniques available:

Frost seeding involves spreading seed over an existing sod in late winter or early spring. As the ground heaves and contracts with repeated

freezing and thawing, seed on the surface gradually works its way into the soil where it can germinate. While this can be an effective, low-cost method for increasing the proportion of certain species, it is usually successful only 60 percent to 70 percent of the time and is not an effective method for completely renovating fields. For best results:

- Remove plant residue from the field with close grazing or by mowing in the fall before seeding.
- Sow seed in late March or early April. Avoid spreading seed on top of snow cover (a few patches are okay), since rapid melting can cause the seed to wash away.
- Certain species work better with frost seeding than others. Red and white clover germinate rapidly, tolerate shading from other plants, and have small seeds that can penetrate into the soil. Many grasses have bulky seeds that remain on the soil surface. The weak seedlings of birdsfoot trefoil and reed canarygrass are unable to compete in an existing sod. Consider increasing the recommended seeding rates by an additional third, since you have less than ideal conditions for seed/soil contact. See our Seeding Rates fact sheet.

Overseeding involves using a seed drill or cultipack seeder to sow seed during the growing season in an attempt to improve the composition of a pasture or hayfield. Simply broadcasting seed over the field usually gives poor results. Use a seeder to deposit the seed below the soil surface. Like frost seeding, overseeding will yield minor improvements but is not appropriate for complete field renovation. For best results, remove residues with close grazing or mowing prior to seeding, and sow either in early spring or in late summer to minimize competition from established plants.

No-till seeding involves suppressing or killing the existing sod, then using a no-till seed drill to plant seed directly into the killed sod without tilling the soil with plows or harrows. This method is the best way to completely renovate a stand when field conditions do not allow for conventional tillage. However the equipment required may make no-till impractical for small-scale or part-time operations. No-till drills are too expensive for only occasional use, and while some equipment dealers and County Conservation Districts may have one available for rent they are hard to come by. Should you choose to use this method, the following considerations will help you succeed:

- Because you can't use tillage to incorporate lime or fertilizer, address any pH adjustments or nutrient deficiencies the season before planting.

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- The best times for planting are late April to early May and mid-August to early September. Spring seedings are best if field conditions allow you to bring equipment on the field, but late summer seedings are better if the field is too wet to work in spring.
 - For spring seedings, apply herbicides the previous fall; for late summer seedings, apply herbicides in midsummer, at least three weeks before seeding.
 - Certain species are better suited for no-till seedings than others. Red and white clover, and timothy germinate rapidly, but reed canarygrass and birdsfoot trefoil have weak seedlings that may not compete with weeds effectively.
 - When seeding legumes, inoculate seed with the appropriate strain of *Rhizobia* bacteria for proper nodulation.



Red Clover germinates rapidly.

Created: December 2012
Updated: November 2017

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