

Virginia's Horse Pastures: Renovating Old Pastures

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Pasture renovation can be defined as a series of practices that result in long-term improvement in the health, productivity, and botanical composition of pastures. These practices include interseeding legumes and grasses, fertilization, liming, weed control, and improved grazing management. Successful renovation requires planning, timelines, and attention to detail. *Before reseeding pastures it is important to determine why the previous stand did not persist.* It is essential that these problems be addressed in the long-term pasture management plan.

Pasture renovation does not always mean reseeding.

Weak pastures can often be improved by simply resting, fertilizing, liming, clipping weeds, and implementing rotational grazing. For this to work, desirable plant species must be present in adequate densities. Pastures that have large spaces, more than six inches, between plants may require reseeding to thicken stands.

Control weeds prior to reseeding. Weeds occur in horse pastures for a number of reasons, including poor fertility, overgrazing, and the use of forages that are not adapted to the region and soil conditions. You must address these issues prior to reintroducing desirable grasses and legumes. The best time to control weeds is the season prior to renovation. You can control perennial broadleaf weeds by using herbicides; however, this will cause severe injury to desirable legumes. Broadleaf weeds must be controlled prior to interseeding legumes. For more information on herbicides for pastures see *Pest Management Guide: Field Crops*, Virginia Cooperative Extension publication 456-016.

Adjust soil fertility prior to seeding. Soil testing is an important first step in pasture renovation. Without proper soil fertility, pasture renovation will not be successful. Apply lime and fertilizer according to soil test recommendations. Soil acidity is a major factor limiting

pasture growth in Virginia. Acidic conditions reduce nutrient availability, limit root growth, and decrease nitrogen fixation in legumes. Lime applications reduce both soil acidity and the availability of toxic metals such as aluminum and manganese. Some lime sources supply only calcium, while applications of dolomitic lime supplies both calcium and magnesium. Lime should be applied the season prior to reseeding to allow adequate time for it to react with the soil. In situations where more than two tons of lime per acre are needed, apply one-half prior to reseeding and one-half after reseeding.

Suppress sod and reduce surface residue prior to reseeding.

The existing sod must be suppressed and plant residue reduced prior to seeding. Sod can be suppressed by hard grazing in late fall and early winter. Overgrazing reduces the competitiveness of the sod and eliminates plant residue. This allows seed to reach the soil surface and establish good soil-seed contact, which is essential for germination and emergence. Vegetation can also be suppressed using a low rate of a nonselective herbicide, but killed pastures with high levels of residue may need clearing before seeding can be successful. For more information on sod suppression using herbicides see *Pest Management Guide: Field Crops*, Virginia Cooperative Extension publication 456-016.

Choose adapted forage species and use certified seed.

Successful pasture renovation requires forage species adapted to the soil conditions present in the pasture and the region of the state where it will be grown. If the forage is not regionally adapted, the chance of maintaining a healthy sod is low. It is also important to select a forage species that will tolerate close and frequent grazing. Use certified seed or a proprietary variety which is adapted to your climatic region. This will ensure that you are getting high-quality, weed-free seed. For more information on adapted species see *Virginia's Horse Pastures: Forage*

Species for Horse Pastures, Virginia Cooperative Extension publication 418-102. For information on varieties of adapted species contact your local Extension office.

Inoculate legume seed. Legumes form a symbiotic relationship with Rhizobium bacteria in which nitrogen from the air is fixed into a plant available form. There is no need for nitrogen fertilizer when legumes make up more than 25 percent of the stand. Legume seed should always be inoculated with the proper strain of nitrogen fixing bacteria before seeding. In many cases legume seed comes preinoculated. If the seed is not preinoculated, just prior to seeding, mix the seed with a prepackaged inoculum available from the seed dealer.

Ensure good soil to seed contact. There are a number of different seeding methods, and regardless of the method used, the objective is always the same, to ensure good soil-seed contact. This helps to ensure that the seed will germinate and emerge in a timely manner. For more information on seeding methods please see No-Tillage Seeding of Forage Grasses and Legumes, Virginia Cooperative Extension publication 418-007, available online at <http://pubs.ext.vt.edu/418-007/418-007.html>.

Frost seeding is accomplished by broadcasting seed onto the soil surface in late winter or early spring. The freezing of the soil surface during the night and thawing during the day cause small cracks to form. These cracks allow the seed to incorporate into the soil. In order for frost seeding to be successful, the seed must reach the soil surface. Therefore, it is critical to reduce plant residue on the soil surface. In addition, broadcast the seed early enough that adequate freeze-thaw cycles take place to incorporate the seed. In Virginia, frost seedings are

most successful when seed is broadcast from late January to early March, depending on location. This method is most successful with clovers and annual lespedeza. It does not work as well with grasses and alfalfa. Seeding rates are shown in Table 1.

Table 1. Legume seeding rates for frost seeding.

Plant Species	Seeding Rate lb/A
Red Clover alone	8-10
Ladino Clover alone	1-3
Red Clover + Ladino Clover	4-6 + 1-2
Annual Lespedeza alone	15-20
Annual Lespedeza + Ladino Clover	8-10 + 1-2

Minimum tillage seeding is accomplished by disturbing 40 to 60 percent of the established sod. This can be done using a disk, field cultivator, or other tillage implement. The tillage implement does not need to penetrate the soil more than two to four inches. Tillage helps to suppress the sod and expose bare soil. After tillage, the seed is broadcast onto the soil surface and cultipacked. This seeding method can be used to reintroduce both perennial grasses and legumes or to overseed annual grasses and legumes into an established sod. Depending on the species being established, this seeding method can be successful in either late summer or early spring. Seeding rates are shown in Table 2.

No-tillage seeding is accomplished by using a no-till and requires more effort and attention to detail. However, it generally produces more consistent results than frost seeding. No-till seeding methods can be successfully implemented in either late summer or early spring.

Table 2. Seeding rates for minimum- and no-tillage seeding.

Plant Species	Seeding Rate lb/A
Red Clover alone	8-10
Ladino Clover alone	1-3
Red Clover + Ladino Clover	4-6 + 1-2
Annual Lespedeza alone	15-20
Annual Lespedeza + Ladino Clover	8-10 + 1-2
Red Clover + Ladino Clover + Orchardgrass	4-6 + 1-2 + 8-10
Red Clover + Ladino Clover + Tall Fescue	4-6 + 1-2 + 10-15
Annual Ryegrass	20-35
Small Grain	90-120
Small Grain + Annual Ryegrass	90 + 15

Because no-tillage seeding does not disturb the sod, it is especially important to suppress the sod and reduce residue prior to planting. *Placing the seed too deep in the soil when no-till seeding is a common mistake that results in stand failures.* It is critical that you check seeding depth every time you use the drill since seeding depth varies with soil conditions. A general rule is that if a little seed cannot be seen beside the slit, then the seeding depth is too deep. For more information on no-tillage seeding methods please see *No-Tillage Seeding of Forage Grasses and Legumes*, Virginia Cooperative Extension publication 418-007 available online at <http://pubs.ext.vt.edu/418-007/>.

Control post-seeding competition. Regardless of the seeding method, it is absolutely essential that you control competition from the existing sod and weeds after the seed has germinated and the seedlings have emerged. Failure to control competition during establishment allows weeds and established vegetation to successfully compete for water and nutrients and shade new seedlings. This will lead to stand failure. You can successfully control competition by frequently clipping weeds to a height just above the growing seedlings. It is important that you clip in a timely manner so that the competing vegetation does not get ahead of the seedlings. Clipping may damage or kill some seedlings, but the losses will be far less than if the competition is not controlled.

Pasture Renovation at a Glance

- Renovation does not always mean reseeding.
- Simply resting pastures and improving management can significantly improve pasture stands.
- Control broadleaf weeds.
- Soil test and adjust fertility.
- Suppress existing sod and decrease surface residue.
- Ensure good soil-seed contact.
- Seed on the proper date.
- Use high-quality seed of an adapted species.
- Inoculate legume seed.
- Never drill small-seeded forages deeper than one-half inch.
- Control post-seeding competition from weeds and established sod.

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