



## Capitol Region Agronomy Team Report

### NO-TILL PASTURE RENOVATION

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While researching the topic of pasture renovation for the section, *Foraging Around*, I came across the following article by Lynn D. Hoffman, Penn State research associate, Department of Agronomy and manager of the agronomy research farm at Rockspring (retired). This classic article still stands as a valuable instruction on the topic, so I submit it again for us to learn from Lynn's experience and wisdom.

Pasture renovation in Pennsylvania has taken many turns at academic interest over the past three or four decades. Unfortunately, when we look at the pasture acreage on most farms, the interest at the farm level has been casual to say the least. If we adopted 1950s pasture renovation technology on the farm today, we could nearly double the productivity of easily half the pasture acreage throughout the Northeast.

With the above admission behind us, we will attempt to develop renovation plans using current technology.

Early success with no-till corn has led us to believe we should carry this practice into forage and small grain production. The major emphasis of this paper will be on no-till forage production. Many guidelines offered below for successful establishment of forage crops are obviously applicable for no-till production of most agronomic crops.

#### Successful No-Till Seeding of Forage Crops

One's first thoughts of no-till establishment often are based on the term "sod seeding." This concept is of establishing or reestablishing a forage species, or combination of species, into an already existing grass or grass-legume sward. Many, many hours of research and extension effort was spent in the first few years of the '70s toward developing this concept. While success in this area is possible in Pennsylvania, farmers are practicing no-till forage establishment following crops such as corn, soybeans, small grains, and others. This approach offers the most logical and consistent establishment of no-till forage crops. Crop rotation has been recognized as an important agronomic tool. It becomes no less important in no-till. In fact, it becomes an effective method to alter the environment to the best advantage of the forage seeding, while reducing, somewhat, the dependence on the system for certain pesticides.

#### Sod Seeding

Successful forage establishment will depend on how well one plans and how well that plan is implemented. A sound decision must be made concerning why the legumes were lost in the present sward. If winter kill and/or overgrazing are the reason, then you may consider replanting the same species. If disease was the problem and there will always be some plant disease present, then you should seriously consider planting a different species in that particular field.

Following are some guidelines to use when planning a no-till sod seeding.

#### Field Evaluation

1. What weeds are present? If Canada thistle or other deep rooted

perennial weeds are obviously a problem, there will be a necessity for two or more applications of 2,4-D and/or Clarity to control them weeds. Clarity will also go a long way toward controlling brushy species in an old pasture. However, Clarity should not be used within one month of seeding and should be applied the fall before. A quart of 2,4-D low volatile ester plus one half pint of Clarity applied in September or October will rid the field of many broadleafed species of weeds. By repeating the 2,4-D spray in the spring before seeding, most of the weeds germinating since the fall spraying will be eliminated. If the field has quackgrass, two well-timed applications of Gramoxone Extra may be necessary. One, either the fall before or in early spring and, after allowing the grass to recover, apply the second spray and seed immediately.

2. Is the area stony or wet? If the area is extremely wet, perhaps corrective measures to improve drainage are possible. Otherwise, it would be best to wait until midsummer to make the seeding. Excessive stoniness may mean poor placement with some planters or extreme machinery wear on others.

3. Is the field fenced well? Management of grazing both before and after seeding is an important step in a successful seeding. Good fences make the job easier. If fences need repairs, this should be done well ahead of time.

*Most failures in sod seeding have been the result of inadequate preparation and lack of understanding of the field situation.*

#### Soil Test

A soil test taken up to a year ahead of time will give plenty of time to apply limestone, if needed. If the field is wet or difficult to get on with equipment, it may be necessary to wait until an opportune time for liming. A soil test is the only reliable way to know whether there are major plant food deficiencies. Again, lead-time is important.

#### Lime And Fertilizer

Limestone applied six or more months in advance of seeding will give the necessary time for pH change to occur. Since limestone will not be mixed into the plow layer, a longer period is needed to produce a

pH change in the rooting zone. Though phosphorus can and should be added at the time of seeding, there is also a good reason to add some ahead of time if the soil test shows a major deficiency. Potassium should be added ahead of seeding where any definite deficiency is noted.

Nitrogen should not be added ahead of seeding for sod-seeding legumes.

Soil test reports will differentiate between no-till and conventional seedings. For no-till seedings, no nitrogen recommended. Nitrogen applied just prior to or at the time of seeding will stimulate existing grass, thus promoting excessive competition for the new seeding. Nitrogen may be added after establishment for promoting growth of rye or sudan x sorghum hybrid.

#### Graze Or Clip

If the area to be sod-seeded is suitable for grazing, the best method of reducing the competition of the existing sod is to heavily graze the field several times prior to seeding. Though grazing is normally considered a poor management technique, this is one time when it is beneficial. Not only does overgrazing rid the area of excess top growth, but it improves the effectiveness of Gramoxone Extra applications.

Removing excess top growth is particularly important when the Midland ZIP-seeder is used because this piece of equipment depends on a shoe-type opener closely following a straight disk sod cutter. Excessive top growth can inhibit the effectiveness of this and other equipment used for sod-seeding. When adequate numbers of grazing animals are not available for removal of the top growth, the next best procedure is to mow or clip the area with all clippings removed for hay or silage. When grazing or close clipping are not feasible, an application of Gramoxone Extra two to three weeks before seeding is recommended. A second application will be required at time of planting. See the current Agronomy Guide for specific recommendations.

#### Apply Herbicides

Much of this topic was discussed under field evaluation, but it is important enough to repeat some phases.

Herbicides replace land preparation in sod-seeding. These chemicals are far less expensive and lower in energy consumption than the numerous operations necessary to prepare and seed a field conventionally. When perennial weeds are a problem, it may be possible to get by with one quart per acre of 2,4-D low volatile ester applied three to four weeks before seeding.

#### Contact Herbicides

##### At Seeding

Regardless of what spray applications went on prior to seeding, the most important application is a contact herbicide as close to time of seeding as possible. Spray prior to planting, not after. One pint of Gramoxone Extra plus surfactant just prior to seeding has worked well for us in Pennsylvania. If the field has been grazed closely, this application has been extremely effective in reducing crop top growth and early competition for new seeding. Round-up Ultra can be used in place of Gramoxone Extra. More detailed instructions are available in the Agronomy Guide.

##### Seed At Best Time

The conditions of the field, seed being sown, and the existing species determine the best time of seeding. If the field tends to be wet, then the seeding should probably be scheduled for midsummer. The flush of spring growth can be pastured several times before seeding or one or more cuttings of the hay crop may be taken off. Regardless of the condition of the field, this is often a good time for seeding because the existing sod will be at its lowest vigor. Throughout most of Pennsylvania, there will be time for the new seedings to gain sufficient growth to be winter hardy, if the seeding is made prior to Aug. 15. Use the seeding time that has worked best for your particular geographic area.

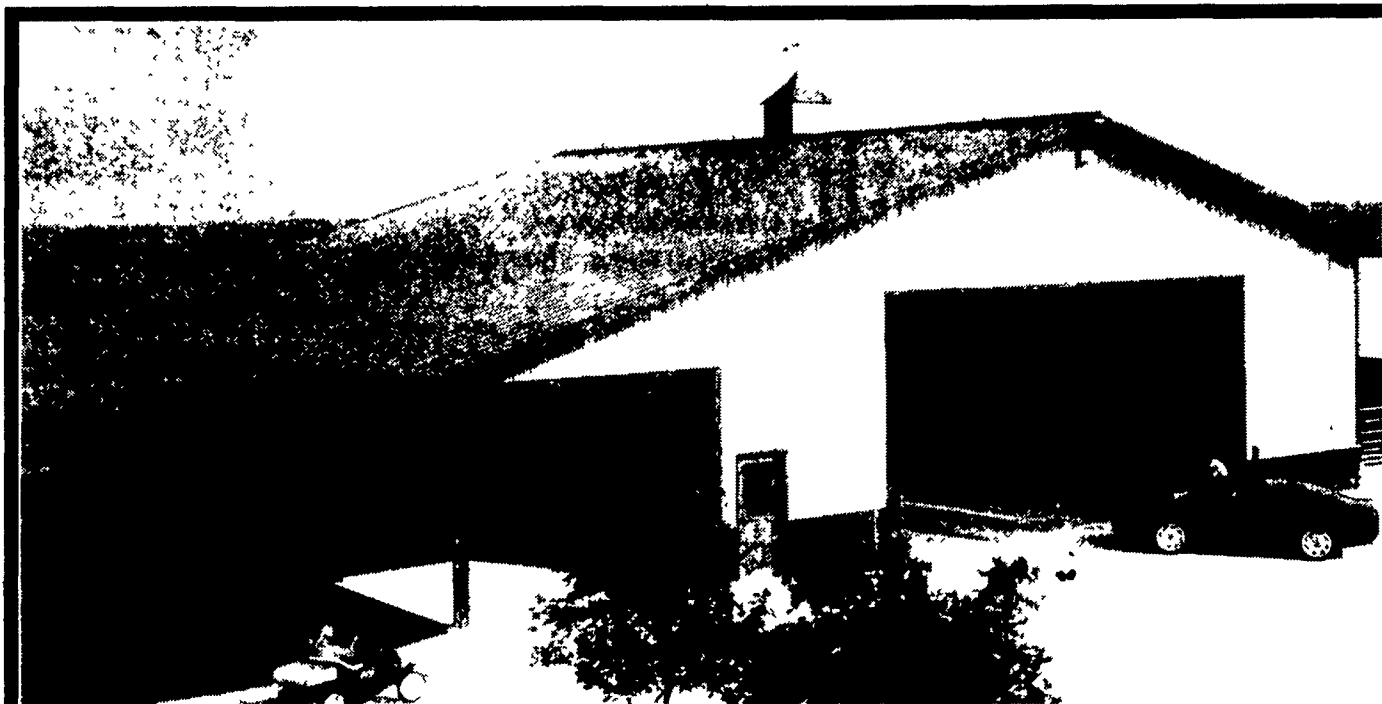
All species of grasses and legumes have individual characteristics that need to be understood if these species are to be used effectively. Alfalfa, red clover, and ladino clover can all be seeded early because they sprout quickly and can grow in cooler weather. Birdsfoot trefoil and crownvetch should not be seeded in early spring because they are slow in germinating and cannot withstand the competition of recovering sod. Timothy should go through a cold period to germinate well. This means that little timothy will be evident in a seeding made midsummer until the following year. Tall fescue and ryegrass will stool out and develop a good root system during the fall and winter whereas orchardgrass and reed canarygrass are probably better seeded in the late spring.

One should recognize that the probability of pressures to the new seeding from disease, insects, and weeds are much greater in sod-seeding than when establishing forages following other crops in a rotation. For this reason, I urge consideration of a short rotation to enable utilization of a wider choice of herbicides, break the disease and insect cycles, and set the stage for more successful no-till forage crop establishment.

#### No-Till Forage In Crop Rotation

Sound crop rotations make agronomic sense in any farming program. They are invaluable tools in no-till forage crop management. There are crops that no-till perennial forages can successfully follow in a pasture program.

With good herbicide programs aided by creative crop manipulation and other sound management practices, we could easily triple or quadruple the yields of most Northeast pastures. The technology is here. Only the genuine desire of the farming public needs to be cultivated.



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