HOW
HORSE OUTREACH WORKGROUP

Guidelines For Seeding New Pastures and Renovating Old Pastures
I: Plan Before You Seed

This publication is the first of a three part series dealing with seeding new pastures and renovating old pastures. This series of publications outlines the procedures to be followed for successful establishment of pastures and the management practices to be used after establishment to maintain your pastures. This publication deals with the first four steps – the planning timetable, soil testing, weed control, and liming and fertilization, all of which need to be accomplished before you seed. These procedures need to start 6 to 24 months prior to the actual seeding. The second publication in the series deals with steps 5 through 8 that occur just prior to seeding. The third publication in the series deals with the seeding procedures and management practices that should be followed during and after establishment. This series of publications takes you step-by-step through the entire process.

High-yielding, high-quality pasture can provide the foundation for profitable feeding programs. But many pastures in the Mid-Atlantic Region have low productivity, primarily due to the lack of adequate fertilization, poor grazing management and the nature of the species present.

Grassland renovation is often thought of as the establishment of legumes into grass sods with only partial sod destruction, but the definition is much broader than this. Renovation is defined for purposes of these publications as the improvement of pasture by the partial or complete destruction of the existing vegetation plus liming, fertilizing, weed control and seeding as may be necessary to establish desirable forage plants. Technology and equipment are available to introduce adapted legumes into old orchardgrass, tall fescue or Kentucky bluegrass sods without destroying the grass by plowing or disking. Advantages of no-tillage renovation without destroying the grass are: 1) higher forage production is obtained the establishment year; 2) sufficient viable grass plants remain for a stand, eliminating the need for reseeding the grass; and 3) much less soil is lost by erosion, resulting in less land deterioration and pollution of the environment.

Grazing animals perform better on grass-legume pastures than do animals grazing pure grass pastures with or without nitrogen fertilizer. The associated legume(s) improve feed quality and add significant amounts of biological nitrogen to the system. Research has shown that renovating permanent pasture will improve production two to five-fold depending on the soil characteristics and condition of the existing sod.

Herbicides such as paraquat (Gramoxone Inteon) and glyphosate (Roundup Weather Max, Touchdown Total or other labeled glyphosate formulation) make possible the suppression of existing vegetation without tillage. No-till drills can insure shallow placement of forage seeds such that good seed/soil contact is obtained. Proper seed placement and vegetation suppression are necessary if the seed is to germinate and forage seedlings are to become established.

Thus, with the proper use of herbicides and no-till seeding equipment, new forage species can be established to improve pasture yield and quality. However, precise management practices are necessary to be successful and it all begins with a management plan prior to the actual seeding.

Apply the principle of the **6 P's** as the first step in seeding new pastures or renovating old pastures -- **Proper Planning Prevents Poor Pasture Performance.** Most seeding failures are a result of a lack of proper advance planning and preparation rather than equipment problems or seeding techniques. The following guidelines are designed to help you make the proper preparations so that the seeding will have the best chances of being successful. Other fact sheets deal with the actual field preparation processes and with seeding and establishment.

Proper Planning to Prevent Poor Pasture Establishment and Performance

1. Begin Planning 6 to 24 Months Prior to Seeding

Preparations for seeding must begin as much as 2 years prior to the actual planting of the seed, especially for no-till seedings in which lime and fertilizer cannot be incorporated and mixed into the soil. Most old, permanent pastures and existing grasslands needing reseeding will require lime, fertilizer and weed control. As will be pointed out in subsequent management practices, these treatments should be applied 6 to 24 months prior to seeding. Also arrangements will need to be made to accommodate the animals elsewhere since the newly seeded area will not be available for grazing for up to 6 to 9 months after seeding, depending upon whether seeded in the spring or late summer and upon growing conditions.

Unless you do not yet have livestock or horses on the farm, do not attempt to reseed or renovate all of the pasture acreage at one time, especially if finances are limited for pasture improvement. When initiating a pasture seeding or renovation program, begin the process with the most productive soils on the farm and end up with the soils needing the largest amounts of lime and fertilizer.. The better the soil conditions, the greater the potential improvement from renovation. **If you do not have the money to apply the amounts of lime and fertilizer recommended by soil test, it is far better to reduce the area to be seeded or renovated and apply the full amount to that area than to spread inadequate amounts of lime and fertilizer over a larger area.** Each succeeding year seed or renovate additional areas as required and as finances allow. The poorest areas will be the last to be seeded but liming and fertilization should begin early on so that the pH and fertility will have been corrected by the time that the seeding is actually done. This is especially true for no-till seedings since lime and fertilizer move very slowly into the ground without tillage and it take time for lime to react in the soil and change the pH. It may be 3 to 4 years or more until renovation of the entire acreage is accomplished. Also, remember that animals must be removed from seeded areas until the plants become adequately established to withstand grazing, which may be as long as 9 to 10 months. This is a second reason for only doing a portion of the acreage at any one time.

2. Control Broadleaf Weeds

Perennial broadleaf weeds are usually present in permanent pastures and in many crop land fields being converted to pasture, especially those that have been poorly managed. Successful establishment of new pastures or renovation of old pastures is dependent upon elimination of these weeds prior to the time of seeding. For best results the weed control program should also begin 6 to 24 months before seeding. Dicamba (Banvel) and 2,4-D are excellent herbicides to use for broadleaf weed control and there are other herbicides that can be used. Consult with your local Cooperative Extension, Natural Resources Conservation Service/Soil Conservation District or farm supply/commercial applicator personnel or go to http://www.agnr.umd.edu/MCE/Publications/EB237online/index2.cfm for appropriate herbicide materials and rates of application for your particular needs. Herbicide materials and formulations are constantly changing so always check for the latest recommendations before making applications.

These herbicides must be absorbed by the leaves and translocated to the roots of the plant to be effective, so do not apply when the weeds to be controlled are dormant or not actively growing due to hot, dry weather. Use the higher recommended rates on deep-rooted, hard-to-kill perennials.

Apply 2,4-D amine or low volatile ester at a rate of 2 to 3 pints (1 to 1.5 pounds active ingredient) per acre. This treatment will kill most legumes that might be present but this step is necessary in order to kill undesirable broadleaf weeds.

Dicamba could be used in place of 2,4-D. For annual broadleaf weeds such as pigweed, ragweed, lambsquarters and smartweed, use 0.5 to 1.5 pints of dicamba (0.25 to 0.75 lb. active ingredient) per acre. For control of biennial broadleaf weeds such as bracted plantain and musk thistle, apply 1 to 3 pints of dicamba (0.5 to 1.5 lb. active ingredient) per acre. For perennial weeds such as dandelion, dock, milkweed, dogbane and Canada thistle, apply 1 to 4 quarts of dicamba (1 to 4 lb. active ingredient) per acre (2 quarts will generally control most perennial weeds). In all cases use the higher rate for more mature weeds.

A tank mix combination of dicamba and 2,4-D will control a greater number of broadleaf weeds than either herbicide alone. For annual weeds use 0.25 to 0.5 pint of dicamba (0.125 and 0.25 lb. active ingredient) with 0.25 and 0.5 pint of 2,4-D (0.125 to 0.25 lb. active ingredient) per acre. For biennial weeds use 0.5 to 1 pint of dicamba (0.25 to 0.5 lb. active ingredient) plus 1 to 2 pints of 2,4-D (0.5 to 1 lb. active ingredient) per acre. For perennial weeds use 0.5 to 1 quart of dicamba (0.5 to 1 lb. active ingredient) plus 1 to 2 quarts of 2,4-D (1 to 2 lb active ingredient) per acre.

With dicamba there is no waiting period between treatment and grazing for non-lactating animals. Meat animals must be removed from the treated area 30 days prior to slaughter. For lactating animals grazing restrictions between treatment and grazing are as follows: 1 pint - 7 days, 2 pints - 21 days, 2 quarts - 40 days, 8 quarts - 60 days. With 2,4-D, do not graze dairy animals on treated areas within 7 days after treatment.

For late winter seeding: Apply 2,4-D amine or low volatile ester and/or dicamba or other broadleaf herbicides the previous fall (late September or early October) while the weeds to be controlled are actively growing. Observe grazing restrictions.

For late summer seeding: Again it is most effective to apply 2,4-D amine or low volatile ester and/or dicamba or other broadleaf herbicides the previous fall. If they were not applied the previous fall, they can be applied in mid-July but the treatment is often less effective. Observe grazing restrictions.

3. Determine Soil Nutrient Levels - Soil Test

Analysis of a representative soil sample is the best method by which existing soil nutrient levels and fertilizer recommendations can be determined. Soil pH, lime requirement and existing levels of phosphorus and potassium can be used with the history and intended use of a field to develop a sound fertility program. For no-till seedings, soil samples should be taken to a 2-inch depth and indicated on the soil test questionnaire as a no-till forage seeding. If the field will be tilled (plowed, disked, etc.) prior to seeding, soil samples should be taken to an 8-inch depth. For more information on soil sampling, go to http://www.agnr.umd.edu/users/agron/nutrient/Plan/Soil_Samp_Card.pdf. A list of commonly used soil testing laboratories can be found at http://www.agnr.umd.edu/users/agron/nutrient/plan/soil-lab-comp.pdf.

A shortage of one nutrient results in poor utilization of other nutrients and generally results in substantial yield loss. On the other hand, using more of any nutrient than is necessary is not only inefficient but is a waste of money and may be damaging to the environment. It takes time for lime and some fertilizer materials to react with the soil and change the pH and fertility levels of the soil, especially when applied to the soil surface and not incorporated or mixed into the soil, so these materials likewise should be applied 6 to 24 months prior to seeding.

4. Apply the Recommended Amounts of Lime and Fertilizer

Forages are no different than other crops in that satisfactory stands and yields are obtained only when the crop is adequately limed and fertilized. Persistent, high-yielding stands are always associated with a favorable pH and high fertility. The key to establishing and maintaining productive forage species and adequate fertilization for the particular forage mixture based on soil test recommendations. Producers should not attempt to renovate unless they are willing to apply the required lime and fertilizer.

Lack of adequate lime on acid soils is the greatest deterrent to high forage production since it affects the efficient utilization of other materials used. Lime corrects soil acidity and supplies calcium or calcium and magnesium, depending upon the liming material used. It not only increases the availability of practically all the essential plant nutrients but also promotes the growth of desirable microorganisms and reduces the toxic effects of aluminum and manganese. Lime should be applied 6 to 12 months prior to seeding.

Phosphorus is especially critical for young seedlings. Phosphorus is also commonly a limiting factor on unproductive, poorly managed pastures. A readily available supply of phosphorus within reach of the roots of young seedlings is essential for normal root development and seedling establishment. Consequently, application of 20 to 30 pounds per acre of P_20_5 fertilizer in the row at seeding is frequently beneficial on soils low in phosphorus.

Potassium is often not as deficient as phosphorus, but may become a limiting factor after soils have been under more intensive production for some time. Eventually, it is often the nutrient that must be added in the largest amount, even on soils not initially deficient, since potassium is required in fairly large quantities by most forage crops. The demand for potassium by young seedlings is relatively low. It is much more important once stands are established. Established forage crops can easily remove 100 to 200 lb/acre/year of potash (K_20) and alfalfa may remove in excess of 400 lb/acre/year. Since a high percent of the potassium in grazed forage is returned to the pasture by the grazing animal, potassium fertilization levels are generally lower for pasture than for hay.

Nitrogen should not be applied in renovation seedings as it quickly stimulates growth of the existing grass and weeds, leading to excessive shading of young seedlings and undue competition for water and soil nutrients.

Summary

Critical to the success of all new pastures and renovation of all old pastures is proper planning prior to the actual seeding so that weeds have been controlled and soil pH and fertility are at optimum levels at the time of seeding. Proper planning helps to ensure that your investments in time, labor and seed will pay off.

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Reviewed by members of the Maryland Horse Outreach Workgroup. The Horse Outreach Workgroup was established to provide information to horse owners on pasture and manure management issues. Technical assistance is available from local county Soil Conservation Districts/Natural Resource Conservation Service and the Maryland Cooperative Extension office. The workgroup consists of representatives from local Soil Conservation Districts, Maryland Department of Agriculture, Natural Resource Conservation Service, Cooperative Extension, University of Maryland, the Equiery, and the Maryland Horse Council. The Maryland Department of Agriculture's Office of Resource Conservation provides coordination for the workgroup.

For more information on horse manure management and other soil conservation and water quality practices, contact you local Soil Conservation District. For more information contact your local Soil Conservation District/ Natural Resources Conservation Service/ (SCD/ NRCS) office or county Maryland Cooperative Extension (MCE) office. Addresses and phone numbers can be found at http://www.mda.state.md.us/resource_conservation/technical_assistance/index.php , http://www.md.nrcs.usda.gov/contact/directory or http://extension.umd.edu or check the listing County Government for SCD/MCE or US Government, Department of Agriculture for NRCS of the phone book blue pages. January 2007