Renovation of Lawns

Lawn renovation involves restoring a deteriorated turfgrass area to an improved condition. Depending on the condition of the turf, this process can be accomplished without establishing a new lawn. Lawn renovation is time consuming and moderately expensive and should not be performed unless steps are taken to correct the underlying cause of turf deterioration. Included in this publication are information on causes of turf deterioration and suggested programs for revitalizing turfgrass areas.

Causes of turf deterioration

The first step in lawn renovation is to correct the primary cause of turf deterioration. Such things as drought, excessive shade, tree root competition, poor drainage, soil compaction, inadequate fertility, acid soils, weed or insect infestation, disease, thatch buildup, improper mowing, poorly adapted grass species and cultivars, and others may contribute to poor turf. Most of these problems can be corrected by renovation, proper turfgrass selection, and improved maintenance practices.

Shade problems

Shade problems may require removing some trees and pruning, and planting turfgrass species that are adapted to shaded conditions. Tree roots may need pruning to reduce competition with grasses for water, air, and nutrients.

Poor drainage

Drainage problem can often be corrected by breaking up compacted soil or through installation of drainage tile. Where surface drainage is somewhat insufficient, the site may have to be regraded so that water is removed from the site.

Soil fertility and acidity

Inadequate fertility or acid soils that can limit turf growth can be determined by testing the soil. Soil testing services are available from the Agricultural Analytical Services Laboratory at Penn State or through private laboratories. Mailing kits for the soil tests are available at a nominal fee from the cooperative extension office in your county. Soil test laboratories will provide recommendation for the amounts of fertilizer and lime that need to be applied to the lawn.

Pests

Pests that cause serious turf damage need to be identified and controlled. If you cannot identify these pests, take fresh samples to your county extension office or another knowledgeable source to have them identified. The Penn State Cooperative Extension publication *Suggestions for Turfgrass Pest Control* contains information on controlling turfgrass pests. There are a number of other publications with similar information in bookstores and at garden centers.

Thatch

Thatch is a tightly intermingled layer of partially decomposed grass stems and roots that develops beneath the actively growing green vegetation and above the soil surface. Thatch decreases the vigor of turfgrasses by restricting the movement of water, fertilizers, and pesticides into soil. Turfgrass roots also grow into the thatch and may become desiccated as the thatch dries. Thatch builds up over a period of years and must be periodically removed by mechanical means. Thatch removal equipment can usually be rented from garden centers or rental outlets.

Mowing

Mowing on most lawns should be at two inches or above on a regular basis as long as the grass is growing. How frequently the grass is mowed depends on the growth rate of the grass. No more than one-third of the total leaf surface should be removed at a given mowing. Thus, if turf is cut at two inches, it should be mowed when it reaches a height no greater than three inches. Clippings do not need to be removed provided the lawn is mowed on a regular basis. All mowing equipment needs to be sharpened and adjusted periodically.

Species and management

Unadapted species and improper management are perhaps the most common causes of turfgrass deterioration. Species and management must be adapted to the conditions present

at the site. Other problems include the use of inferior turfgrass cultivars and poor-quality seed.

Once the reasons for lawn deterioration are recognized and steps are taken to correct the problems, the renovation program can begin. The following three programs are designed to fit most renovation situations. Some operations may need to be altered or omitted depending on the individual situation.

■ Renovation Program I

(early to midspring or late summer to early fall)

This program is suggested when the existing population of turfgrasses include *50 percent or more desirable species*; there are few or no perennial grass weeds (bentgrass, nimblewill, quackgrass, tall fescue, etc.); and the thatch layer does not exceed ½ inch.

1. Weed control

As a general guide, if only easy-to-kill broadleaf weeds such as dandelion or plantain are present, 2,4-D may be applied and the seeding may be done in two weeks. A combination of 2,4-D, MCPP, and dicamba is suggested if the weed population contains many different weed species or hard-to-kill weeds such as knotweed, clover, or ground ivy. A six-week waiting period before seeding will be required following the use of this herbicide combination. For other less common weeds, the appropriate herbicides should be applied according to the manufacturer's directions. After waiting the prescribed period and assuming adequate weed control has been obtained, you are ready to proceed with the remaining renovation operations. These steps should be followed in sequence as one continuous operation.

2. Mow

Mow area closely (approximately ¾ inch) and remove all clippings, leaves, and other debris by sweeping or raking.

3. Thatch

Thatch is best removed with dethatching equipment with vertically rotating blades or aeration equipment. Remove thatch only during periods of cool weather and adequate moisture. Thatch should not be removed during periods of high temperatures or drought or during late fall when winter desiccation may occur. Maintaining a soil pH between 6.5 and 7.0 will favor microbial activity and breakdown of thatch.

4. Cultivation

Mechanical aerating machines that remove plugs of soil from the turf area are used to alleviate soil compaction and to prepare a partial seedbed. Aeration should consist of a minimum of eight to ten times over the area. A partial seedbed may also be prepared by using a spiking machine or by severe hand raking. Results with these methods will not be as good as with aeration equipment.

5. Lime

Lime should be applied in accordance with a soil test. If the lime requirement exceeds 100 pounds per 1,000 square feet, apply 100 pounds per 1,000 square feet at the time of renovation and the remainder the following spring or fall.

6. Fertilizer

Fertilizer should be applied in accordance with a soil test. In lieu of a soil test, apply 20 pounds per 1,000 square feet or a 0–20–20 or equivalent fertilizer plus 25 to 30 pounds per 1,000 square feet of a turf-grade 10–5–5 or equivalent fertilizer having 35 percent or more of the total nitrogen as water-insoluble nitrogen.

7. Drag

Following cultivation (aeration, etc.) and lime and fertilizer application, drag the area with a large door mat or section of chain link fence to mechanically work lime and fertilizer into the cultivated soil.

8. Seedbed preparation

Repeat the cultivation operation to further prepare the seedbed for seeding. If an aerator is used, six to eight times over will again be necessary.

9. Seeding

A turf-type disk seeder is the best tool for seeding. This machine cuts the seed directly into the soil, ensuring the firm contact between seed and soil that is necessary for maximum germination. When no disk-type seeder is available, uniformly broadcast the seed over the area. The total seed quantity should be divided into two equal lots, sowing one lot in one direction and the second at right angles to the first. Good-quality seed of turfgrass species adpated to the environmental and use conditions should be used. In open, sunny areas, improved turf-type cultivars of Kentucky bluegrass, perennial ryegrass, or tall fescue can be used. If Kentucky bluegrass is chosen, use a blend of equal parts of two to five cultivars. Mixtures of turfgrass species are preferred in most lawn plantings. In sunny or partially shaded areas use a mixture of 50 to 60 percent Kentucky bluegrass, 30 to 40 percent fine fescues, and 10 to 20 percent perennial ryegrass. Heavily shaded areas having relatively dry soils may be seeded with 100 percent fine fescues. Heavily shaded areas with moderately wet soils may be seeded to rough bluegrass. See extension publications *Turfgrass Seed and Seed Mixtures* and *Turfgrass Species for Pennsylvania* for more information on seed and turfgrass species.

10. Drag

Following seeding, drag the area again to work the seed into the seedbed and to cover the seed with a light layer of soil.

11. Roll

Firm the seed into the soil by lightly rolling the area.

12. Mulch

Where there is little existing grass, a very light straw application of mulch may be applied to retain moisture and to promote germination. Care must be taken that the mulch is not heavy enough to smother or completely shut off light to the existing grass.

13. Water
The seeded area should be kept moist until the seed has germinated and the seedling plants have become well established.

■ Renovation Program II
(early to midspring or late summer to early fall)
This program is suggested when the existing population of the area includes *less than 50 percent desirable turfgrass species*; there is an infestation of perennial grass or grass-type weeds; and the thatch layer does not exceed ½ inch.

1. Weed control
Under the conditions described, a nonselective herbicide with very short soil residual, such as glyphosate (Round-up), is necessary to kill all vegetatian. Although a seeding may be made safely within a few days following application of glyphosate, the suggested option is that seeding be withheld until it becomes obvious a good kill has been obtained.

2. Mow
Same as Program I, Number 2.

3. Thatch
Same as Program I, Number 3.

4. Cultivation
Same as Program I, Number 4.

5. Lime
Same as Program I, Number 5.

6. Fertilizer
Same as Program I, Number 6.

7. Drag
Same as Program I, Number 7.

8. Seedbed preparation
Same as Program I, Number 8.

9. Seeding
Same as Program I, Number 9.

10. Drag
Same as Program I, Number 10.

11. Roll
Same as Program I, Number 11.

12. Mulch
No mulching is necessary because the dead vegetation will serve as a mulch.

13. Water
Same as Program I, Number 13.

■ Renovation Program III
(early to midspring or late summer to early fall)
This program is suggested when the thatch layer exceeds ½ inch.

1. Weed control
Treat with glyphosate as in Program II, Number 1, if perennial grass or grass-type weeds are present.

2. Thatch removal
Remove existing sod, including the thatch layer, with a mechanical sod cutter or till with a rotovator and rake out sod and thatch material.

3. Grade
Grade off high spots and fill low spots. It may be necessary to bring in additional topsoil.

4. Lime
Limestone should be applied in accordance with a soil test.

5. Basic fertilizer
Basic fertilizer (phosphate and/or potash) should be applied in accordance with a soil test.

6. Tillage
Work limestone and basic fertilizer into the soil to a depth of four to six inches by tillage.

7. Soil physical amendments
If a soil test indicates a low organic matter content, work the recommended amount of organic matter into the soil to a two- to four-inch depth.

8. Starter fertilizer
Starter fertilizer should be applied in accordance with a soil test and raked lightly into the soil.

9. Seed
Apply seed with a broadcast-type seeder. Do not use a turf-type disk seeder. Seed according to seed recommendations as in Program I, Number 9.

10. Cover seed
Lightly rake or drag to cover seed.

11. Firm soil
Lightly roll to place seed in firm contact with the soil.

12. Mulch
Mulch seeded area with clean straw. For best results mulch heavy enough to completely cover the soil. Remove part or all of the mulch within a few days after germination. Where equipment is available, the area may be hydromulched with cellulose fiber.

13. Water
Same as Program I, Number 13.

Although these procedures appear quite complex, they are only the first step in renovating the lawn. From this point on, a sound management program must be followed to ensure continued improvement of the lawn. Publications on various phases of turfgrass management, such as mowing, fertilization, and irrigation, are available through your local county cooperative extension office.

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