Turfgrass Renovation

There are a number of reasons for why a particular lawn may need to be re-established or renovated to create a new turfgrass area. Renovation becomes necessary when the lawn has been damaged to the point that it cannot recover with standard maintenance practices like additional waterings and fertilizer. The process can involve changing the lawn from one species of grass to another or replanting a new cultivar.

If a lawn has been damaged so that it is not capable of recovering in the desired time frame, the reason for the injury must be assessed. In some cases, environmental factors may contribute to the decline. Shady conditions, excessive erosion or poor drainage can all lead to thin stands of turf. Other causes of turfgrass decline are thatch buildup, compaction, unadapted grass species, low fertility, disease and insect damage.

The time to renovate can be either in the spring or fall. Fall renovation (September 1 - October 15) is preferred because the weather is cooler, root growth is promoted with warm days and cool nights, and there is less competition with germinating annual weeds which will die off over the winter. Spring seeding can also be done, however, the soils are typically too cool to promote rapid germination and root growth. Weeds also will present a season-long problem.

There are several methods of renovation and which one to chose will depend upon the conditions at hand. The renovation method used should consider such factors as the amount of good turfgrass left in the area, the amount and kinds of undesirable grass and weeds present and the existing thatch accumulation. If the stand of turf contains a high percentage of desirable grass and contains few weeds, then the renovation process is fairly simple. If, however, weeds dominate the lawn and excessive thatch has developed over the years, a more extensive renovation program may be necessary to provide a good planting area.

Here are step-by-step instructions on how to go about renovating a home lawn. All three programs presented will lead to a good stand of turfgrass. The program you chose to follow should be based upon the condition of the lawn.

Renovation Process

The initial process of lawn renovation begins with a diagnosis of the problems which lead to the poor turf stand in the first place and doing some soil testing. The information gained will be valuable in correcting any problems that formerly existed and preparing the seedbed for the establishment of a new lawn. If the condition which led to a poor stand of turfgrass is not corrected, you must recognize that even renovation of the turfgrass area by planting more seed will not be successful.

The process of diagnosing problems can be confusing so professional help may be necessary, especially when disease or insect problems are indicated as primary causes to turfgrass decline. On-site evaluation may be necessary. A second way to get a diagnosis is to submit a sample of the affected turfgass to a

University plant clinic or independent consulting service. Specific sampling instructions should be followed because inadequate samples are difficult to work with. Call ahead before samples are collected and describe as many of the symptoms as you can, noting when the problem first started, if it seems to be progressing and what time of year the damage is most severe. These clues will assist the diagnostician in determining a probable cause for the injury.

The nutrient status of the new seedbed is important information for renovating the lawn. Renovation presents the opportunity to mix the soil and incorporate fertilizers and organic matter into the soil layers. After the lawn has been established, no further opportunity will be given to improve the subsurface soil. The best approach to this is to have the soil tested. This should be done about 3 or 4 weeks in advance of beginning the renovation so that adequate time is given to analyze the test results and acquire any fertilizers necessary to improve the lawn area at the time of seedbed preparation. Samples should be taken at the 3-inch depth in the turfgass. This zone represents the area of concentrated root development and nutrient uptake. Six to 8 samples should be collected for every 1,000 square feet of lawn. If larger turf areas are to be sampled, simply increase the number of subsamples up to 2,500 square feet of lawn area. A second sample may be required for larger lawns. In general, a single sample collected from the front and back yard is adequate.

Mix the samples together in a bucket, remove the organic material by hand picking and submit this for the soil test. There should be enough soil to comprise about 1 cup. This sample can be air dried by placing it out in the open for several days before packaging. Request that the soil testing laboratory run a basic test for nutrients including pH, organic matter, phosphorous and potassium. No other tests are generally required.

Step-by-Step Renovation

There are several renovation methods from which to chose. Each depends upon the extent of renovation necessary. The first (Program 1) should be followed if the lawn contains 50 percent or more desirable turfgrass, contains no other undesirable perennial grasses and has a thatch depth of less than one-half inch. The second (Program 2) should be followed if there is less than 50 percent desirable turfgrass left in the lawn area, but has a thatch depth less than 1 inch. The third (Program 3) approach should be done when the turfgrass stand is less than 50 percent and the thatch layer is greater than 1 inch in thickness.

Program 1

1. The first step is to identify all the weeds in the lawn area. Weeds which are easy to kill like dandelion and plantain, can be treated with 2,4-D about 2 weeks prior to seeding. Weeds which are harder to kill, like clover, nutsedge and violets, should be treated with stronger herbicides. Consult University Extension recommendations for which products control certain weeds. Generally, a waiting period of 6 weeks is required prior to seeding when these herbicides are used so as to not affect grass seed germination.

2. The lawn area should be mowed to within three-quarters of an inch of the soil surface. The leaf clippings should be collected during this process and composted separately from other garden waste since they may contain herbicides. Mowing close to the soil surface will ensure that plenty of light will reach the germinating seedlings once they have emerged to support their initial development.

3. Even if less than one-half inch of thatch exists in the lawn area, it should be mixed into the soil and exposed to air to assist in its decomposition. Thatch consists of dead stems and roots which have accumulated over the years. It is the primary reason for restricting water movement, air and nutrients into the root zone. The best way to remove thatch is with a power rake. These can be rented easily and do a good job of removing and mixing the thatch into the soil. You may also inquire about having a lawn service power rake the area.

As an alternative to using a power rake, you may also use a core aerification machine. Core aerators cut three-quarter of an inch diameter plugs from the soil and deposit on the soil surface. This loosens compacted areas and opens up the area to air and water movement into the subsoil. Through core removal, it also removes and mixes the thatch. Lawn services will often use a combination of power raking and core aerifying to cultivate the lawn area during the renovation process. This produces a superior seedbed.

Dethatching by hand can also be done, however, it is very labor intensive. If hand dethatching is the preferred method, the debris should be removed from the site and composted. Power rakes generally do not disturb the thatch as much as that done by hand and therefore, debris removal is not as critical.

4. When you receive the soil test recommendations, calculate the fertilizer amounts for each nutrient. A high phosphorous fertilizer is typically recommended for establishing a lawn from seed. If a soil test has not been made and prior to more extensive preparation of the seedbed, broadcast about 5 pounds of phosphorous (phosphate) per 1,000 square feet. It would be most desirable to cultivate this into the subsoil, if possible. This step could precede power raking to take advantage of the mixing action of the power rake or just prior to regrading and tilling. The amount of phosphate recommended is equivalent to about 10 pounds of 0-46-0 (triple superphosphate) or 25 pounds of 0-20-0 (superphosphate).

After the seedbed has been prepared and before seeding, apply a turf grade starter fertilizer. Broadcast 20 pounds of 10-5-5, 10-6-4 or 16-8-8 over 1,000 square feet of area. This will give roughly 1 to 1.5 pounds of actual nitrogen to the seedbed. Alternatively, you may apply 7 to 8 pounds of 13-25-12, 10 pounds of 10-10-10 or 5 pounds of 18-46-0. An additional amount of nitrogen fertilizer will be necessary 6 to 8 weeks after germination when the grass is 1 to 2 inches tall. This amount should be equivalent to about 1 pound of nitrogen per 1,000 square feet.

5. There are two ways to seed the area; by hand using a drop seeder or spreader or by using a power disk seeder. Seeding by hand is simple and, provided the seedbed is prepared well, should produce a good stand of turfgrass. Chose a good quality turfgrass recommended for the climate, maintenance level, wear tolerance and exposure to sunlight (Table 1.). Follow the seeding rates with respect to the type of grass selected (Table 2.). The seed should be spread in two directions; the second at right angles to the first direction. This will ensure a more uniform coverage. If the area has been core aerated, then the seed will find its way into the core holes. That presents an ideal location for germination protected from drying winds and as a water collection site. After seeding, lightly rake the area to partially cover the seed. If not compacted, lightly roll the soil to firm-up the surface and gain good seed/soil contact.

Table 1. **Characteristics of Turfgrass Species**

Turfgrass	Maintenance Req.	Wear Resistance	Shade Tolerance
Bluegrass	High	Low	Medium
Tall fescue	Low-Med	High	Med-High
Fine fecsue	Med-High	Med-High	High
Ryegrass	High	Medium	Med-High
Zoysiagrass	Med-High	High	Low-Med

Table 2. **Suggested Planting Rates for Turfgrass**

Turfgrass Species	(lbs. per 1,000 sq. ft.)
Bluegrass	1 to 2
Ryegrass	6 to 8
Tall fescue (turf-type)	6 to 8
Fine fescue*	1 to 2
Zoysiagrass, Bermudagrass	2-inch plugs spaced 6 inches apart (55 sq. ft. of sod required for 1,000 sq. ft.)
* includes hard, sheep, spreading, creeping and chewing fescues	

The disk seeder presents perhaps the best method of seeding a new area. This unit cuts grooves into the soil and deposits the seed in a furrow. This makes for good seed-to-soil contact without raking and rolling (tight corner may have to be done by hand) and promotes rapid germination. These units may be rented, however, they are quite large, heavy and sometimes difficult to manipulate. This is another case where a lawn service should be consulted.

6. Depending upon the turfgrass species chosen, the grass should germinate within 3 weeks. Bluegrass cultivars generally require 14 to 21 days; tall fescue 7 to 14 days; perennial ryegrass 5 to 10 days and fine fescue 7 to 14 days. At first, keep the seedbed continually moist by watering lightly each day just enough to moisten the surface. As seedlings emerge, decrease the waterings and lengthen the time period of watering so that more of the water will soak in deeper in front of the developing root system.

Mowing can begin after the grass plants have reached the recommended mowing height. The first mowing will make the lawn look neat and help to control any weeds which have begun to grow alongside the turfgrass. Re-fertilize the area within 6 to 8 weeks with a water-soluble nitrogen fertilizer at the rate of 1 pound of nitrogen per 1,000 square feet. This should be adequate for the rest of the season.

Program 2

This program is designed for turfgrass areas which have less than 50 percent desirable grasses and contain thatch less than one inch. The idea with this program is to eliminate all grasses and weeds from the seedbed prior to reseeding plus mix the thatch to assist decomposition.

Step 1: Allow the grass to grow, omitting one regular mowing. Apply a 2 percent solution of glyphosate to the entire area and wait 7 to 10 days for the area to die back. For cool season grasses like bluegrass and fescue, this can be done in the last week of August. For Zoysia, 2 to 3 applications may be necessary beginning in mid-August spaced 10 days apart. Zoysia is more difficult to kill and should be entirely eliminated when this grass is being replaced with a cool season grass so that it does not become re-established.

Step 2: Follow preceding steps 2 through 6 for Program 1.

Program 3

This approach is for lawn areas which have an abundance of thatch in excess of 1 inch. Special steps must be taken to reduce the thatch layer to a manageable level.

Step 1: Apply glyphosate according to label directions as indicated in Program 2 and wait 7 to 10 days. Zoysia may require additional applications.

Step 2: Use a mechanical sod cutter to remove the dead turfgrass areas or begin tilling to a depth of 4 to 6 inches. This will mix the thatch into the soil and speed decomposition. At this time, apply a high phosphate fertilizer according to step 4 in Program 1.

Step 3: Regrade all areas and create a smooth seedbed for planting. Control drainage by modifying the slopes.

Step 4: Broadcast a starter fertilizer and then proceed to seed the area as in step 5, Program 1. Follow up by lightly rolling the area to gain better seed/soil contact.

Step 5: Water and keep weed free.

Turfgrass Selection

When renovating a lawn area, it is important to select the right turfgrass to reestablish. Planting grasses which are not adapted to the climate can cause many problems leading to failure or inferior turf quality. Selection of species and varieties can be confusing because of the many available and the match of growing conditions to the selection. The cost of grass seed is low in comparison to the time the turf will be in existence and the effort in preparation of the planting area. Above all, purchase top-quality, certified seed or disease-free sod.

In Missouri, the climate is one which receives both extremes of high heat in summer and potentially very cold winters. Often referred to as the transition zone, this area presents the difficulty of deciding whether a cool season or a warm season grass is best. The most common grasses planted here include Kentucky bluegrass (*Poa pratensis*), tall fescue (*Festuca ansndinaceae*), fine fescue (*Festuca rubra*) and zoysia (*Zoysia japonica*).

Kentucky Bluegrass

Kentucky bluegrass is a cool season, drought tolerant grass. During extended periods of temperatures over 90 degrees and drought, it will become dormant. Irrigation is very important for maintaining summer quality. It performs best on moist soils that are fertile and have a pH of 6.2 to 6.8. It does not generally tolerate shade, although some varieties will survive in moderate shade. These are also varieties which have been bred for resistance to powdery mildew, a fungal disease that turn the grass blades white. While you may be interested in planting Kentucky bluegrass in shade, you should consider it more for open, sunny areas.

When buying Kentucky bluegrass, you can assume that most of the varieties are improved over earlier selections. Early varieties were susceptible to disease and extremes in environmental conditions. Kentucky bluegrass labeled as “common” represents the earliest bluegrass type. Common bluegrass is still present on the market and should be used with an understanding that leaf spot diseases and environmental conditions may, in time, affect its overall quality.

If planting a solid lawn of bluegrass, it is best to use a blend of several improved varieties mixed together. Blending diversifies the genetic base and this translates into increased disease resistance and tolerance to an environmental conditions.

Tall Fescue

Tall fescue is a hardy cool season grass with tough leaf texture and good wear tolerance. It is adaptive to a wide range of pH and soil textures. Tall fescue does best in sunny locations or in moderate shade and has superior heat and drought tolerance in comparison to other cool season grasses making it a good choice for this area.

Traditionally, fescues have had the distinction of being fairly course textured, but very durable. Earlier varieties were best suited for athletic fields and school grounds. Where these conditions prevail, Kentucky-31 is a good choice. New and improved varieties have been developed which have a softer feel because of a finer leaf. These seem to be the best choice for home lawns and include such varieties as Arid, Jaguar, Apache, Bonanza, Olympic and Adventure.

The seeding rate for fescues is high, recommended at the rate of 6 to 8 pounds per 1000 square feet. This is because they have a low recuperative potential and therefore, spread very slowly to fill in blank spots. If spots bigger than a half-foot square exist in a fescue lawn, it is best repaired by seeding directly.

Sometimes fescue is mixed with bluegrass to establish a lawn area. This mix combines the superior ability of bluegrass to re-colonize bare areas with the hardiness of fescue. If a solid lawn of fescue is desired, mix several varieties to decrease the odds of problems due to diseases like brown patch, a common fungal disease of fescue.

Fine Fescue

Perhaps the best choice for shady areas is a fine fescue (red, hard, sheep, spreading, creeping and chewing). Often these are mixed with Kentucky bluegrass to establish lawns under trees or low light situations. The bluegrass has the ability to do well in sun and fills in bare spots while the fine fescue will colonize the dry, shady areas. Fine fescues should be mowed high and receive little fertilizer and water.

Zoysia

Zoysia is a warm season grass which forms a dense lawn from underground and aboveground runners. It is very heat and drought tolerant. A common objection with using zoysia as a home lawn is that it has a very short season, greening up in late spring and going dormant in early fall. For this reason alone, many homeowners chose not to plant zoysia. Otherwise, it is a superior grass for this area with good winter hardiness.

The best location for zoysia is in full sun. Only moderate shade can be tolerated. Often zoysia grown in shade will become invaded with cool season grasses as can be seen on north sides of trees where the leaf canopy makes more dense shade. Zoysia thrives during the high heat of summer and requires less water and fertilizer than many other cool season grasses. Because it grows so dense, weeds are often choked out. The disadvantages besides it's short season includes a higher expense to get it established, the heavy thatch accumulation which must be controlled, difficulty in mowing and its invasive habit.