



HOME & GARDEN

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Home & Garden Mimeo # HG 102

Lawn Establishment, Renovation, and Overseeding

In addition to enhancing the landscape, lawns provide practical benefits. A healthy lawn increases property values, controls soil erosion, filters pollution from runoff water, moderates summer ground temperatures, and adds oxygen to the air. The purpose of this factsheet is to help homeowners achieve the lawn they desire by covering the following topics:

- ✓ The differences between lawn establishment, renovation and overseeding.
- ✓ Guidelines to determine if complete lawn renovation or overseeding will be required.
- ✓ Common reasons for lawn establishment failure.
- ✓ Maintenance and care after seeding.
- ✓ A month-to-month calendar of lawn care practices.

PRE-PLANTING DECISIONS

To achieve optimum results, a plan should be made before undertaking lawn establishment, renovation, or overseeding. The more time spent on the initial planning, the less time and money will be spent on lawn maintenance. You will have a healthier lawn that is less dependent on pesticides. Questions to consider are:

- 1) Do you want to plant cool season turfgrass or warm season turfgrass?
- 2) What are the site conditions? Sun or shade? Are there areas of poor drainage? Is the soil high in clay or very sandy? Do conditions vary throughout your yard?
- 3) Should you seed or install sod?
- 4) How much foot traffic will the lawn receive? Will this be a play area for children or dogs?
- 5) Does the soil need to be amended?
- 6) Has the topsoil been removed due to new construction?
- 7) How much time and money do you have to devote to your lawn?
- 8) Will partial renovation or overseeding be sufficient to improve the quality of your lawn, or must you undertake complete lawn renovation?

Cool Season vs. Warm Season Turfgrass

Growing a healthy lawn in Maryland can be challenging. Maryland is located in a transition zone. Both cool season and warm season turfgrass can be grown, but our climate is not favorable for the growth of either group of grass over the entire year. To establish and maintain an attractive healthy lawn, site preparation, the choice of the proper type of grass, and correct management practices are essential.

In western Maryland, or the mountain region, cool season grasses are better adapted. The coastal plain, southern Maryland and the eastern shore, as well as the piedmont region, central and northern Maryland, have warmer winters and both cool season and warm season grass can be grown. Tall fescue grows throughout Maryland.

<u>Table of Contents</u>	
<u>Topic</u>	<u>Page</u>
Pre-Planting Decisions.....	1
Lawn Establishment.....	4
Seeding.....	5
Sod	6
Sprigs and Plugs	6
Renovation.....	7
Repairing Bare Spots.....	8
Care and Maintenance after Seeding.....	9
Reasons for Turf Establishment Failures.....	10
Common Lawn Problems.....	10
Turfgrass Maintenance Calendars.....	11

Educating People To Help Themselves

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Cool Season	Warm Season
Turf-type tall fescue, Kentucky bluegrass, fine fescue, and perennial ryegrass.	Zoysiagrass and bermudagrass.
Depending on rainfall or irrigation, may remain green throughout the year. Can go dormant in summer droughts.	Goes dormant from mid-October through mid-May. After the first frost, turf turns a straw-like color.
Higher maintenance required, although tall fescue requires less maintenance than Kentucky bluegrass (e.g. tall fescue does not require dethatching.)	Zoysiagrass requires less nitrogen fertilizer compared to cool season turf and grows slower so less mowing is necessary. However, periodic dethatching is necessary.
Best time to establish is late summer or early fall.	Established in late spring.
Grows most actively in the spring and fall.	Grows most actively from late-spring through summer.

Turfgrass species grown in Maryland

- 1) **Turf-Type Tall Fescue:** is primarily a bunching-type turfgrass that sometimes forms short rhizomes. It is highly recommended for Maryland because it readily adapts to a wide range of soil and sunlight conditions. Compared to the other turfgrass species, tall fescue is the most drought tolerant and least prone to disease and insect problems. The only major disease problem is brown patch. Tall fescue is considered a quality turfgrass for home lawns. It performs best on open, sunny sites in well-drained soil, but can tolerate a fair amount of shade. Kentucky 31 (K-31) was commonly recommended in the past, but new improved cultivars have deeper green leaf color, finer blade texture, and higher tiller densities (which allow the grass to fill in.) Seed germinates in 7 to 14 days.
- 2) **Kentucky Bluegrass:** is best known for its medium-to-fine leaf texture and rich medium-to-dark green color. A distinct characteristic of bluegrass is the canoe-shaped blade tips. Bluegrass is a higher maintenance turf than the fescues. In general, it requires more nitrogen fertilizer to maintain its color. Thatch build-up tends to be more of an issue, so periodic dethatching is required. Performs best on open, sunny sites in well-drained soils and does not grow well in the shade. Bluegrass spreads by an extensive system of underground stems called rhizomes. For this reason it is often used in sod production and can recuperate well from damage caused by disease, heavy traffic and pests. Compared to the fescues, bluegrass has a higher incidence of disease problems, especially summer patch, and is more sensitive to drought damage and Japanese beetle grub feeding. Seed germinates in 14 to 21 days.

- 3) **Fine Fescues:** are comprised of creeping red fescue, hard fescue, chewings fescue, and sheep fescue. They are narrow-leaved and medium green in color. This group of grasses is recommended for shady conditions. These grasses do not perform well under frequent foot traffic. Soil needs to be well-drained. Fine fescues will not tolerate wet conditions or high rates of nitrogen fertilizer. Fine fescues are prone to thatch build-up and periodic dethatching is recommended. Seeds germinate in 7 to 14 days.
- 4) **Perennial Ryegrass:** is a medium textured bunching grass with deep green blades. A pure perennial ryegrass lawn is not recommended because of disease susceptibility. Gray leaf spot is a serious disease problem. Commonly used in seed mixtures because it germinates quickly, perennial ryegrass should not exceed 5-15% of the mixture. Seed germinates in 5 to 10 days.
- 5) **Zoysiagrass:** forms an excellent low maintenance lawn in full sun. Zoysia is a warm season grass recommended for the warmer areas in Maryland such as southern Maryland and the eastern shore. Zoysia is very drought tolerant, requires less fertilizer than other turfgrasses, and generally needs less mowing than cool season grass during the growing season. The blades are wiry and are fine-to-medium textured. Zoysiagrass is established from sprigs, plugs or sod. Some disadvantages are that it is slow to establish, turns a straw-brown color from mid-October through mid-May, and can become invasive by encroaching into ornamental beds and neighboring yards. For additional information refer to Agronomy Mimeo #69 *Planting and Care of a Zoysiagrass Lawn*.
- 6) **Bermudagrass:** is another warm season grass that requires full sun. This grass roots deeply, and is recommended for high traffic areas such as athletic fields. Bermudagrass has the deserved reputation of becoming very invasive. It encroaches rampantly into ornamental beds, will spread to surrounding properties, and is very difficult to control. Bermudagrass also goes dormant after the first frost and turns a straw-brown color. Bermudagrass lawns are not commonly cultivated by homeowners and generally are not recommended.

Advantages of a Turf-Type Tall Fescue Lawn

- ❖ Adaptable to a variety of site conditions, including sun or partial shade.
- ❖ Least prone to disease and insect infestations.
- ❖ Drought tolerant. In hot, dry conditions can go dormant, but then recovers when rainfall and cool temperatures return.
- ❖ Requires less fertilization than Kentucky bluegrass.
- ❖ Does not form a heavy thatch layer.
- ❖ Forms an attractive durable lawn.
- ❖ Newer cultivars are darker in color and finer in texture.
- ❖ Is the best type of turfgrass for Maryland's climate!

Comparison of Turfgrass Species					
Turfgrass species	Drought tolerance	Full sun	Shade	High traffic tolerance	Insect and disease resistance
Turf-type tall fescue	Excellent	Excellent	Fair	Good	Good
Kentucky bluegrass	Good	Excellent	Fair-Poor	Excellent	Poor
Fine fescue	Good-Fair	Poor	Excellent-Good	Poor	Good
Perennial ryegrass	Poor	Excellent	Fair-Poor	Good	Poor (Fair: if seed contains endophytes*)
Zoysiagrass	Excellent	Excellent	Poor	Good	Good
Bermudagrass	Excellent	Excellent	Poor	Excellent	Good

* Endophytes are beneficial fungi or bacteria that live within plant tissue. Perennial ryegrass and fescue turf with high endophyte levels are more drought resistant and less prone to damage from sod webworm and chinch bugs.

Seed vs. Sod

Both methods have their advantages and disadvantages and should be considered carefully before deciding on which method to use. Either seed or sod can be used for establishment or repairs of smaller areas. One possibility is installing sod in areas where lawn aesthetics are important, such as in a front yard, and reserving seeding for the backyard.

SOD: Advantages and Disadvantages

Advantages	Disadvantages
Can be installed any time of the year as long as the ground is not frozen and daytime temperatures are lower than 90°.	Higher initial cost.
Immediate results are obtained and establishment is faster.	Limited choice of turf cultivars.
Quicker erosion control.	More labor required for installation.
Less problem with weed encroachment.	Not always readily available.

SEEDING: Advantages and Disadvantages

Advantages	Disadvantages
Lower initial cost.	Limited time period for establishment. Seed needs to be sown in late summer to early fall for greatest success rate.
A particular desired cultivar of grass can be sown.	Daily watering is necessary, sometimes twice a day, depending on weather conditions during initial establishment period.
Less labor and time is required for installation.	Takes a longer time for lawn to become established. Seeded areas need to be restricted from use (up to a period of two months.)
Greater flexibility in planting a mixture for specific site conditions (e.g. mixture that performs better in the shade or on high traffic areas can be sown.)	Greater chance of weed encroachment during establishment.
	Heavy rain can wash seed away.

MEANS OF ESTABLISHMENT				
	SEED	SOD	SPRIGS	PLUGS
Tall fescue	*	*		
Kentucky bluegrass	*	*		
Perennial ryegrass	*			
Zoysiagrass		*	*	*
Bermudagrass	*	*	*	*

LAWN ESTABLISHMENT

Lawn establishment is the planting of turf on an area where there was bare ground, or on an area cleared of existing vegetation, such as trees or brush.

Site preparation steps: for seed or sod

1) **Have your soil tested.** This is a basic but necessary step. Soil test results will provide important information regarding the condition of your soil. Soil pH will be determined and, if you have acidic soil, a liming recommendation will be provided. Soil pH should be between 6.0-6.8 for optimal turf growth. Soil tests also indicate phosphorus and potassium levels. Nitrogen levels are not tested because nitrogen is very mobile in the soil and levels are not constant. A complete fertilizer recommendation will be provided based on the amount of nitrogen your lawn will need to become established or grow properly during the growing season. A special test can be performed to determine the amount of organic matter present in your soil. Organic matter is vital for improving soil structure, in which air, nutrients, and water can contribute to growing a healthy turfgrass. Soil should contain a minimum of 2%

organic matter. Soil test kits can be obtained by calling the Home and Garden Information Center at 1-800-342-2507, from your local county extension office, or can be ordered online via the Home and Garden Center Information Center website www.hgic.umd.edu.

2) **Rough grade.** Rough grading involves sloping the area for proper drainage away from existing buildings eliminating any low spots that could cause poor drainage. A slope of 1-2 percent away from buildings is recommended. It is difficult to establish and maintain turf on heavily sloped areas. So, if possible steep slopes should be avoided by building a retaining wall, terracing, or planting a low maintenance groundcover. When major changes in contour are undertaken, it is advisable to remove the topsoil and stockpile it until needed. Then grade the subsoil. When spreading out the topsoil (either stockpiled or brought in), till a few inches of the topsoil into the subsoil. This will prevent poor root development due to the abrupt change in soil texture between subsoil and topsoil. After grading the subsoil, cover with a minimum of four inches of topsoil or a mixture of topsoil and organic matter. The grade around existing trees should not be altered because damage to the trees will eventually occur. All debris including, large stones, excess building material, and roots should be removed. When purchasing topsoil ask where it came from. Do not purchase topsoil that is full of rocks and debris, is gray or white in color, has a bad odor, or a sticky, gummy texture.

3) **Add soil amendments and organic matter.** Properly prepared soil is crucial for the success of your lawn. After your lawn is planted it is difficult and costly to go back to make improvements to the soil. Into the top six inches of soil, till the amount of lime and fertilizer that was recommended from your soil test results. Maryland soils, whether they are clay or sandy, benefit from the addition of organic matter. Organic matter can be compost, leaf mold, or well-rotted manure. A minimum of a two-inch layer should be spread over the planting area and incorporated into the soil. Never till soil that is too wet, and avoid overtilling because damage to the soil structure will occur.

Square Feet	Cubic Yards of Compost Required per 5,000 Square Feet*				
	Inches of compost to be applied				
	¼"	½"	1"	1 ½"	2"
5,000	4	8	16	24	31
10,000	8	16	32	48	62
15,000	12	24	48	72	93
20,000	16	32	64	96	123
25,000	20	40	80	120	154
30,000	24	48	96	144	185
35,000	28	56	112	168	216
40,000	32	64	128	192	246

*calculations are rounded off to whole numbers.

- 4) **Do final grading.** Rake area to remove any minor irregularities. If needed, lightly roll the seed bed before seeding or installing sod with a water roller to firm up the soil. Do not use heavy equipment, because it will compact the soil making it difficult for roots to grow.

SEEDING

Late summer to early fall (mid-August to mid-October) is the best time for seeding cool season turfgrasses. Warm soil and moderate air temperatures encourage seed germination and there is less competition from weeds. If seed is to be planted in an area where autumn leaf drop is a concern, seeding should be done in August. The second best time to seed is late February through early April. Seed planted at other times fails to become established, usually because of weather conditions.

Use a drop spreader or slit seeder to sow large areas. Small areas can be sown by hand or using a hand-held seeder. Divide the seed into two equal parts, apply half in one direction (north/south) and the remainder in the opposite direction (east/west.) Pay attention to seeding rates. Light seeding will give you a thin, clumpy, and weedy stand of grass. Heavy seeding results in overcrowding, poor rooting, and disease problems.

After seeding gently roll the area with a water filled roller or tamp down the seed with a rake to ensure good seed-to-soil contact. Raking seed into the soil is not necessary. Mulch the area with clean straw (not hay.) Mulch helps to keep the seedbed moist and prevents erosion. Spread the straw thinly so the soil surface is visible through the straw. The mulch may be left on the area to decompose. It is especially important to use mulch on areas that cannot be irrigated. Even so, if weather conditions are dry, expect poor results. Reseed when rainfall returns. An alternative to straw mulch are pellets made from paper waste (however, they are more expensive).

<u>Seeding Rates for Lawn Establishment</u>	
<u>Turfgrass species</u>	<u>Seeding rate @ lbs/1000 sq. ft.</u>
Turf-type tall fescue	6 to 8 lbs.
Kentucky bluegrass	2 to 3 lbs.
Fine fescue	4 to 5 lbs.

Purchasing Grass Seed

Select high quality seed. Poor quality seed is low in viability, contains weed seeds or undesirable grass species. It is a waste of time, money and effort for the homeowner to use it. Select a turfgrass species or variety that is adapted to the site conditions. Refer to the section on **cool season vs. warm season turf, turfgrass species grown in Maryland** and [*Agronomy Mimeo #77 Turfgrass Cultivar Recommendations for Certified Sod and Professional Seed Mixtures in Maryland.*](#)

Maryland certified seed (inspected by the Maryland Department of Agriculture) is sold in large quantities only (fifty pound bags) and is available through specialty seed stores or farmers' co-ops. It sometimes can be found at garden centers in smaller quantities or sold by the pound. All grass seed for sale has a tag or label listing basic information on the package which helps to determine the quality of the seed. Read the information before purchasing the seed to avoid costly mistakes.

Information on Seed Labels

- Name and address of labeler. This is the party responsible for the container's contents.
- Lot number. Used to track down the original site of production.
- Species and cultivar of turfgrass seed listed in order of predominance. Refer to *Agronomy Mimeo # 77 Turfgrass Cultivar Recommendations for Certified Sod and Professional Seed Mixtures in Maryland* for a list of recommended turf cultivars. The word "mixture" must appear on the label if it is a mixture of different turf species.
- Percentage by weight of pure seed of each species and variety (purity percentage.)
- Germination percentage (percentage of viable seed.) Should be 70% and above.
- Percentage by weight of other crop or undesirable grass seed. This number should be between zero and 0.5%. Avoid purchasing seed that contains *Lolium multiflorum* (annual ryegrass), also called Italian ryegrass. This annual grass is found in inexpensive grass seed, only lives for one year, and makes it difficult for the desired grass species to become established. Avoid turf-type tall fescue seed that contains *Dactylis glomerata* (orchardgrass), which is a difficult perennial grass weed to control.
- Percentage by weight of weed seed. This number should be close to 0.00%. Do not purchase seed that lists a percentage of noxious weeds such as *Cirsium arvense* (Canada thistle.)
- Percentage by weight of inert matter. Inert matter includes chaff, soil, and debris. This number should be 0.5% or less.
- Date on which the germination test was conducted. To ensure a high germination rate, use seed within one year of purchase. As seed ages, the percentage of viable seed decreases, resulting in poor establishment.

Mixtures and Blends

Seed is commonly sold in mixtures or blends. A *mixture* is a combination of two or more grass species, e.g. Kentucky bluegrass and perennial ryegrass. A *blend* is three or more cultivars of the same species. Mixtures and blends are popular because they increase the genetic diversity of your lawn. Certain grass species and cultivars are more susceptible to disease and insect problems, so using mixtures and blends increases your lawns ability to resist diseases and overcome insect infestations. Mixtures are also used if growing conditions vary throughout

your yard. It should be noted that the trend in recent years has been to plant a 100% turf-type tall fescue lawn. Turf-type tall fescue seed is commonly sold as a single species. For additional information on seed mixture recommendations refer to Agronomy Mimeo #77 Turfgrass Cultivar Recommendations for Certified Sod and Professional Seed Mixtures in Maryland.

High traffic areas: A mixture of turf-type tall fescue (80%-90%) and Kentucky bluegrass (20%-10%) is an excellent lawn turf. The spreading root system of the Kentucky bluegrass will improve the recuperative ability of the tall fescue and help it recover when injured from excessive traffic, drought, or pest damage.

Full sun areas: A blend of turf type tall fescue or a single recommended cultivar can be grown in full sun. Sometimes a mixture of Kentucky bluegrass (85%-100%) and perennial ryegrass (15%-0%) is planted, but this is considered a high management turf that requires irrigation and regular maintenance and therefore, should be avoided.

Full sun to moderate shade areas: Turf-type tall fescue is recommended. A single cultivar or a blend may be planted.

Shady areas: A single fine fescue cultivar is recommended when tall fescue or Kentucky bluegrass are difficult to establish. Refer to Agronomy Mimeo #82 *Maintenance of Turf in Shade*.

Hydroseeding

Hydroseeding is a popular option for establishing new lawns, commonly used by home builders. This is a process that applies seed to the soil with a large-capacity sprayer. Seed, fertilizer, water, and mulching material are mixed together to form a soupy consistency that covers the soil. As with any type of lawn establishment, post-care management is extremely important. Refer to the section on the **Care and Maintenance after Seeding**.

SOD

Purchase a high quality sod. High quality sod will contain species of grass that are adapted to the growing conditions in Maryland. Sod produced under the supervision of the Maryland Department of Agriculture is called *certified sod*. Certified sod is free from weeds, undesirable grasses, and has fewer insect and disease problems. Sod fields are inspected before being seeded and periodically during sod production. To find sources of Maryland Certified Sod call the Home and Garden Information Center, 1-800-342-2507, Monday-Friday 8:00 a.m.-1:00 p.m., or log onto the Maryland Department of Agriculture website at <http://www.mda.state.md.us/plant/certifie.htm> to download a list of turfgrass producers in your area.

The majority of sod produced is Kentucky bluegrass or a mixture of tall fescue and Kentucky bluegrass. The spreading growth habit of the Kentucky bluegrass knits the sod together. Depending on the grower, tall fescue, fine fescue, zoysiagrass and bermudagrass sod can also be found. For a wider range of adapt-

ability in Kentucky bluegrass sod, select one that consists of three to five cultivars. Look for fine fescue sod if shade is a consideration.

If possible, inspect the sod before delivery. Sod should be evenly moist, but not soaking wet. Do not purchase sod that looks dried out or has grass blades that are turning yellow; it should be a deep green color. Sod should be dense and well-knit so that it can be cut into strips and handled easily. The thickness of the roots and soil should be ½ to ¾ of an inch.

Installing Sod

Prepare the planting area in advance of the sod delivery. Refer to the section on **site preparation steps**. If soil is dry, moisten the bed with a light application of water prior to sod installation. Sod is perishable and should be installed immediately after delivery, especially when the weather is hot and dry. If it is necessary to store the sod for a couple of days, lay it out flat (grass side up) in a cool shaded area and do not let it dry out.

Use a straight edge such as a driveway or sidewalk as a guide when laying down the first pieces. Lay the next strips close to, but not overlapping, the first. Gently tamp down the edges to ensure good contact with the soil. Stagger the ends, similar to the pattern used when laying bricks. Use a sharp tool to trim off the excess pieces or to cut pieces to fit irregular spaces. To avoid damaging the newly installed sod, use a plank or a piece of plywood to stand or kneel on. This will distribute your weight evenly over a larger area. If the site is sloped, the sod should be laid perpendicular to the slope and secured to the ground with stakes or landscape pins until the sod is rooted.

Roll the sod lightly with a water-filled roller, then water the sod immediately after installation. Water to moisten the soil below, but do not overwater. Sod will usually root in 2-3 weeks. Daily watering may be necessary during the rooting process. Never let the sod dry out during the establishment period. Avoid laying sod when daytime temperatures exceed 90° for an extended period.

SPRIGS AND PLUGS

Warm season lawns (bermudagrass and zoysiagrass) are established by vegetative means. Sprigs are pieces of stolons or individual plants, that contain nodes where the new grass develops. Plugs are small pieces of sod that are planted at regular intervals.

Tips on Sprigging and Plugging

Sprigging and plugging are generally done in mid to late May, when warm season turf begins to green up. To install sprigs, use a hoe or shovel to make 1 to 2 inch deep furrows, spaced about 6 to 12 inches apart. Sprigs are placed 4 to 6 inches apart. After placing the sprigs, fill the furrows with soil. Leave about one-third of the sprig above the soil line. A faster method of planting is broadcasting the sprigs over the planting area (called stolonizing.) Evenly distribute the sprigs over the soil, cover

them with a thin layer of soil or compost, and roll them with a water-filled roller. Though simpler, a higher mortality to the sprigs will occur using this procedure.

Plugs are planted as any small plant would be. Small holes can be made with a trowel, small spade, or some type of bulb planter. They should be planted 6 to 12 inches apart. The closer they are spaced, the sooner they become established.

Irrigate immediately after sprigging or plugging. Do not let the area dry out. Lightly water the area daily. When the weather is hot and dry, two or three light daily waterings may be required. It is important to keep weeds from becoming established. Refer to Agronomy Mimeo #69 *Planting and Care of a Zoysiagrass Lawn*.

RENOVATION: Complete Renovation, Overseeding, Repairing Bare Spots

Renovation is the process of improving a poor quality lawn. There are three methods of renovation: complete renovation, overseeding, and repairing bare spots. To prevent problems with your renovated lawn, it is important to determine the cause of the deterioration of your existing lawn. Always begin with a soil test.

CAUSES OF LAWN DETERIORATION

- ❖ Large weed infestations
- ❖ Insect and disease damage
- ❖ Tree roots
- ❖ Drought
- ❖ Shade
- ❖ Heavy foot traffic
- ❖ Poor drainage
- ❖ Lack of Topsoil
- ❖ Acidic soil
- ❖ Under or over fertilizing and fertilizing at the wrong time of year
- ❖ Poor cultural practices (e.g. mowing too short or infrequently)

Complete Renovation

Complete renovation involves killing the existing lawn to bare soil and reseeding or installing sod. This process should be started in mid-August if you are sowing seed (especially if it is necessary to kill perennial grass weeds) and be finished by the end of September.

Reasons for Complete Renovation

- 1) More than 50% of lawn is infested with weeds, especially perennial grass weeds such as bermudagrass, nimblewill, or quackgrass.

- 2) Large patches of dead grass due to drought damage, insects, and disease.
- 3) You want to convert your lawn to another species of turfgrass. For example, you currently have a tall fescue lawn and you want to plant zoysiagrass.
- 4) Lawn damage due to excessive use.
- 5) A change of grade is necessary.
- 6) Lawn is a mixture of too many different and/or incompatible grass species such as Kentucky bluegrass and zoysiagrass.

Complete Renovation Steps

- 1) Have your soil tested.
- 2) Decide on seed or sod.
- 3) Kill the existing lawn. Use a non-selective herbicide that contains glyphosate. Glyphosate is relatively low in toxicity and does not persist in the soil. Do not apply the herbicide on a windy day. If the herbicide drifts onto ornamentals, injury will occur. The area should not be mowed a few days prior to or after the application of the herbicide. Controlling tough perennial grass weeds (bermudagrass and quackgrass) can take as long as a month to achieve. Two or three applications of the herbicide throughout the month may be necessary. Plan to begin the process in early to mid-August. Herbicides are effective when plants are actively growing and the weather is warm. This will allow ample time for reseeding. Proceed to the next step when the weeds have turned brown and no new growth has occurred. After renovation, if an infestation of bermudagrass or quackgrass begins again, immediately spot-treat the areas with glyphosate. Do not wait! Refer to *HG 101 Guide to Controlling Weeds in Cool Season Turf*.
- 4) Prepare the site for planting. Set your lawn mower to ½ - 1 inch and mow the area, then rototill the dead plant material to create the seed bed. Or you can rent a vertical mower or power rake to prepare the site. Make at least two passes over the area. If a true thatch layer exists use a vertical mower or, in extreme cases, rent a sod cutter. Add lime and fertilizer according to soil test results and till or rake into the soil. A 2 to 4 inch layer of organic matter (if soil is clay or sandy) or purchased top soil can be incorporated into the soil at this time. Rake the area or lightly roll with a water-filled roller.
- 5) Sow the seed or install the sod. Water immediately after installation and begin lawn care practices. Refer to section on the **Care and Maintenance after Seeding**.

Overseeding

Overseeding improves lawn quality without the need to kill existing turf. In conjunction with proper management practices - such as adequate fertilization, mowing at the proper height, and testing your soil to see whether applying lime is necessary - a marginal lawn can be improved significantly.

Overseeding, dethatching, and aeration are done when lawns are actively growing. Mid-August through early October is the best time (typically, warm season turf is not seeded.)

Reasons for Overseeding

- 1) To repair marginal damage sustained in summer.
- 2) To improve the overall quality of lawn.
- 3) To minimize weeds by thickening up turf.
- 4) To convert a lawn to an improved grass variety. Improved cultivars of tall fescue can be overseeded into an existing tall fescue lawn.
- 5) To follow use of a core aerator (which reduces soil compaction) or a vertical mower (which removes thatch.)

Overseeding Steps

- 1) Have your soil tested.
- 2) Decide on the type of seed.
- 3) Control weeds. Handpull weeds, or selectively control broadleaf weeds using an herbicide. Check herbicide label to see if there is a waiting period before grass seed can be sown. Perennial grassy weeds should be spot treated with a non-selective herbicide a week or so before overseeding. Refer to *HG 101 Guide to Controlling Weeds in Cool Season Turf*.
- 4) Mow the lawn about 1 inch in height.
- 5) Use a steel rake to remove clippings and to scratch the soil, or rent a core aerator, vertical mower, or slit seeder to make the job easier.
- 6) Topdress with organic matter to improve soil quality. This is often done after core aeration. Refer to the section on **Lawn Renovation Machines**.
- 7) Sow the seed at the recommended seeding rate. See below.
- 8) Tamp down the seed using the back of a steel rake or use a water-filled roller to firm the seeds into the soil. Good seed to soil contact is necessary for germination and proper root development.
- 9) Refer to section on the **Care and Maintenance after Seeding**.

Overseeding rate@lbs./1000sq.ft.	
Turf-type tall fescue	4 lbs.
Kentucky bluegrass	1 ½ lbs.
Fine fescue	2.5 lbs.

Lawn Renovation Machines

Power rake – Used for thatch removal. This is a lawn-mower type machine with tines instead of blades that rip the thatch out of the ground. Hand raking is then needed to remove the debris.

Vertical mower – Also called a verticutter. Similar to a power rake but cuts down through the thatch into the soil. Renting a verticutter is better than a power rake if you are planning to overseed after thatch removal. It cuts deeper into the soil and therefore provides better seed-to-soil contact. Rake up the debris before sowing the seed.

Slit seeder – This machine makes small grooves in the soil, then deposits the seed into the slit. Apply half of the seed in one direction and the other half on a second pass, perpendicular to the first. When renting a slit seeder, check to be sure it deposits the seed after it makes the groove and not before.

Core aerator – Core aeration is a means of alleviating compacted soil. Aeration opens the soil up to allow air, water, and fertilizer to penetrate and roots to grow. The soil can be further improved by topdressing, i.e. broadcasting a thin layer (¼ – ½ inch) of organic matter such as compost, well-rotted manure, or leaf mold, over the lawn after aerating. The aerating holes provide an entry way for the organic matter to enter the soil. Use caution if topdressing an established lawn. If more than ¼ – ½ inch of organic matter is applied damage to the grass crowns can occur.

Look for an aerator that pulls plugs of soil out and distributes them on the surface, instead of one that just punches holes in the ground. Plugs should be 2 – 3 inches long and about ½ inch in diameter. Plugs can be left to decompose on the lawn. Aeration should be done on moist soil only. Avoid soil extremes (either too dry or too wet.)

Water-filled roller – Used to smooth the planting site and to firm seed into the soil after sowing. Also used to lightly roll sod after installation.

Sod cutter – A machine, either manual or powered, to remove turf. Turf is removed in strips exposing the bare soil. Used before complete lawn renovation.

Repairing Bare Spots

Dead patches of grass should be reseeded to keep your lawn uniform looking. When selecting seed, try to purchase a species that is similar in color and texture to the existing turf. Remove the dead grass, loosen up the top 1-2 inches of soil. Leaf mold or compost can be worked into the soil. Sprinkle the seed over the area, being careful not to seed too heavily. It is not necessary to cover the seed with soil. Tamp the area down with the back of a steel rake. Straw mulch can be lightly applied. Water with a fine mist spray. Keep the area moist until the grass becomes established.

CARE AND MAINTENANCE AFTER SEEDING

Plan on spending some time caring for your lawn for the first two months after sowing seed. Good care will ensure the success of your seeding operation.

- 1) **Watering** – If watering is not possible, postpone seeding until September. Temperatures are cooler and typically rainfall increases. Watering is critical to successful lawn establishment. Allowing the seed bed to dry out will prevent germination or kill seedlings after germination. A newly seeded lawn requires daily watering, if it has not rained. When conditions are windy and dry, the planted area may require several light waterings a day. Pay special attention on hot, windy days, when humidity is low. Sandy soils dry out quickly and require more frequent irrigation. Watering with a light mist is best. The idea is to keep the top layer of soil moist but not saturated. **Once wet, grass seed must never be allowed to dry out.**

As germination begins continue to water as necessary. Never let seedlings get stressed to the point of wilting. As seedlings grow and mature, the frequency of watering can be decreased, but duration of watering is increased. The water now needs to be available at the root zone and should penetrate the soil so that the top 4-6 inches of soil is moist. It is best to water earlier in the day so leaf blades do not remain wet overnight.

- 2) **Mowing** – Proper mowing technique is an important part of lawn maintenance that is often ignored. Mowing lawns too short, or on an infrequent basis, causes grass to become susceptible to drought injury, weed infestations (especially crabgrass), diseases, and foot traffic injury. Begin to mow the new turf when it reaches a height one-third higher than the normal mowing height (e.g., if a 2 ½ height is desired, mow when the turf reaches 3 ½ inches.)

Typically, under optimum growing conditions, this is four to six weeks after seeding. Between 2 ½ and 4 inches is the proper mowing height depending on the grass species. During subsequent mowings follow the “one-third” rule. One-third of the vegetation (measure from the soil line to the blade tips) should be removed at each mowing. Removing too much of the leaf blade at each cutting stresses the new lawn. Soil should be dry enough so that ruts are not formed by the wheels of the lawnmower. Mower blades should be sharp, so a clean cut is made. Generally, mowing needs to be done on a weekly basis during the growing season.

- 3) **Fertilizing** – Fertilizer applied according to soil test results during the initial seeding period is sufficient for 6-8 weeks. Follow-up applications of fertilizer are made as part of a regular maintenance program. See Table 1. For cool season turf, if the seeding was done in the fall, fertilizer should not be applied later than 6 weeks after the first frost. For seed sown in spring, do not apply after June 1.
- 4) **Weeds** – Tilling the seedbed exposes dormant weed seeds to water and light which allows them to germinate. Competition from weeds is greatest on turf sown in early spring. Hand pull the weeds in small areas. Grass seedlings are sensitive to chemical injury, so broadleaf herbicides should not be applied until the lawn has been mowed three or four times or according to label directions. The control of annual grass weeds, such as crabgrass can be a problem. Pre-emergent herbicides (used for annual grass control) will also kill grass seedlings (Tupersan® is the exception.) Refer to *HG#101 Guide to Weed Control in Cool Season Turf*. Read the product label before applying the herbicide to avoid injury to the new turf.
- 5) **Traffic** – Young seedlings are easily injured. Newly seeded areas should be restricted from foot traffic for a least a month after the seed has germinated.

Table 1.

Nitrogen Fertilizer Schedule*

	Sept.	Oct. thru mid-Nov.	Mid-Nov. thru mid-Dec.	Mid-May thru June+	July thru August	Total
Turf-type tall fescue	1 lb.++	1 lb.++	.5 lb.++	.5 lb.**	0	2 ½ - 3 lbs.
Fine fescues	0	1 lb.++	.5-1 lb.++	0	0	1 ½ - 2 lbs.
Kentucky bluegrass	1 lb.++	1 lb.++	1 lb.++	.5 - 1 lb.**	0	3 ½ - 4 lbs.
Zoysiagrass	0	0	0	1 lb.	1 lb.**	2 lbs.
Bermudagrass	0	0	0	1 lb.	1 lb.	2 lbs.

* Nitrogen amount can be reduced by 25% if grassclippings are left to decompose on lawn after mowing (grasscycling).

++ Applications can be combined if fertilizer contains 50% WIN (Water Insoluble Nitrogen).

** Omit this application if turf color and density are acceptable.

+ Nitrogen should be applied to cool season turf before the end of May.

REASONS FOR TURF ESTABLISHMENT FAILURES

1. Existing topsoil was removed and the turf was planted on subsoil, which contains rocks and building debris and very little organic matter. This leads to poor root development. Weak, thin turf is the end result.
2. Compacted soil or poor seed bed.
3. Soil was not amended with fertilizer, lime, or organic matter.
4. A preemergence herbicide was applied to the area before or shortly after the seed was sown.
5. Improper selection of turfgrass species for site conditions.
6. Poor quality seed or sod.
7. Old seed. Grass seed should be sown within a year of purchase.
8. Too much or too little seed was sown.
9. Planted too deeply. Seed should not be covered with soil.
10. Wrong time of year for planting.
11. Lack of establishment before summer.
12. Poor root zone conditions, such as tree root competition under shade trees.
13. Lack of watering after seeding or sod was installed.
14. Poor post-installation care such as, improper mowing or fertilizing.

COMMON LAWN PROBLEMS

Problem - *The lawn planted on a new home site is thin and dying out.*

It is a common practice for most topsoil to be removed during construction. Builders then plant new lawns on a thin layer of topsoil that covers infertile subsoil. To compound the problem, the soil also may contain building debris, stones and rubble and was compacted during construction. This prevents good root development.

Solution - As soon as you move into a new home, lawn maintenance must begin. Refer to section on the Care and Maintenance after Seeding. After a year or two, if your lawn is weak, thin, and not well established, it is time to take further action. Refer to the section on Renovation and Overseeding. Always begin with a basic soil test. In addition, test the amount of organic matter in the soil. The degree of action you need to take depends on how your lawn appears. If your lawn is thin, has large patches of bare areas, and is weed infested, complete lawn renovation is necessary. Remove stones, debris and roots, then till in a 2-4 inch layer of organic matter, such as compost, well-rotted manure or leaf mold.

When a lawn is hydroseeded it is common for perennial ryegrass to be used. Perennial ryegrass germinates quickly, but is prone to disease problems. Complete lawn renovation should be considered to convert your lawn to a suitable turf species such as, tall fescue. Sometimes large pieces of building debris are buried. In that case, large irregular shaped areas of your lawn will die out. The obstacle prevents the grass roots from maturing because the soil is too shallow. Should you notice such an area in your yard, dig in the vicinity and remove the debris. Then reseed the area.

Problem - *Lawn is overrun by weeds.*

Solution - Identify and estimate the number of weeds in your lawn. If your lawn contains more than 50% weeds, especially if they are perennial grass weeds, complete lawn renovation should be undertaken. Refer to HG101 *Guide to Weed Control in Home Lawns*. If you have broadleaf or annual grass weeds, use an appropriate herbicide, in conjunction with sound management practices and overseeding to dramatically improve lawn quality.

Problem - *The lawn underneath mature trees is thinning and dying out.*

One of the most difficult places to grow grass is underneath trees. Tree roots out-compete grass roots for water and nutrients, and turf begins to thin out. The location is often too shady for turf to thrive. Most grass species need full sun. Shady locations are also cooler and more humid, which encourages fungal diseases and moss to grow.

Solution - Prune the trees in the area to allow more sunlight to penetrate the area and to increase air circulation. Plant a species of grass that tolerates more shade such as, fine fescue (site needs to have well-drained soil). Instead of grass, mulch the area (a 2-3 inch layer of mulch is sufficient), or convert to ornamental beds and plant a shade tolerant groundcover. Do not add more than a 2 inch layer of soil, mulch, or compost underneath the dripline of the trees when planting in the area or tree roots may be adversely affected.

TURFGRASS MAINTENANCE CALENDARS

Proper maintenance keeps your new lawn healthy and vigorous. Lawns can suffer from neglect as well as over-management. The following calendars outline the necessary steps and the timing for growing healthy turf.

Cool Season Turf

Mid-August through mid-October

- ❖ Apply nitrogen fertilizer according to soil test results.
- ❖ Apply lime according to soil test results. Lime can be applied at anytime of the year as long as the ground is not frozen. Fall application is best because winter snow and rain, combined with the freezing and thawing of soil, help to incorporate the lime into the soil. Can be applied at the same time you fertilize.
- ❖ Treat persistent broadleaf weeds with an herbicide. Late-September to early October is a good time for controlling persistent broadleaf weeds because plants will move foods from the leaves along with the herbicide down to the root system.
- ❖ Dethatch, aerate, or overseed if needed.
- ❖ If brown patches develop in your lawn, check for white grubs. Cut a square foot section of your lawn on three sides and roll it back. Treatment should be considered only if more than 6-8 white grubs are present. When rainfall is adequate, grub damage will not be as extensive and a grub count of 8-15 will not cause significant damage. Browning will occur quickly when weather is dry and lawns are stressed. Grub feeding damage is most noticeable in mid-August through September. Feeding damage in the spring is not as noticeable because lawns are actively growing. Look for lawn insecticides that contain imidacloprid or halofenozide. They should be applied in late spring through mid-summer to control the grub population that is active in late summer. Grubs are more of a problem in Kentucky bluegrass lawns.

Mid-October through December

- ❖ Rake and remove fallen leaves. Leaves can be shredded and composted.
- ❖ Make your last mowing cut ½ to 1 inch lower than your normal height to discourage matted grass and snow mold.
- ❖ Last application of nitrogen should be no more than 6 weeks after first frost.

January through February

- ❖ Avoid foot traffic on frost-covered turf, as injury will occur.
- ❖ Maintain your lawn mower. Blades should be sharpened to avoid turf injury.
- ❖ Do not use urea or other fertilizer for deicing walkways or driveways because run-off ends up in the Chesapeake Bay.

March through April

- ❖ Apply crabgrass preemergent if needed. Crabgrass seeds germinate when soil temperatures average 54° F. for seven days. Preemergents should be applied mid-March through early April.
- ❖ Reseed bare spots. If a preemergent was applied, check the product label to see whether overseeding needs to be postponed.
- ❖ If nitrogen fertilizer was applied in the fall, a spring application should not be necessary. If turf appears weak, thin and did not green-up, apply ½ - 1 lb. of nitrogen/1000 sq. feet in May. Do not apply fertilizer during the summer.

July through mid-August

- ❖ Perform soil test.
- ❖ Plan lawn renovation projects.
- ❖ Mow lawn to proper height and at regular intervals.
- ❖ Established tall fescue lawns do not need to be irrigated. They will go dormant and green up again when cooler temperatures arrive.

Warm Season Turf

March through April

- ❖ Perform soil test.
- ❖ Control wild onions with a broadleaf weed control containing 2,4-D, MCPP + Dicamba (Trimec®.) Look for an herbicide that does not contain fertilizer.

May through June

- ❖ To remove brown, overwintered foliage, mow turf to a height of 1".
- ❖ Apply lime and fertilizer according to soil test results.
- ❖ Order plugs or sprigs if starting a new warm season lawn. Late May is the best time to plant zoysiagrass and bermudagrass.
- ❖ Apply 1 lb. of nitrogen/1000 sq. ft to established lawns.
- ❖ Water newly planted plugs or sprigs daily during the first 2-3 weeks to prevent drying and as needed during the summer.
- ❖ Rent a core aerator, vertical mower, or power rake to remove thatch when thatch layer exceeds ½".

July through August

- ❖ An additional 1 lb. of nitrogen/1000 sq. ft can be applied to your lawn if needed.
- ❖ Typically warm season turf needs to be mowed every 10-14 days.
- ❖ Mow turf to a height between 2-3".

September through November

- ❖ The last cut of the season should be 1 ½".
- ❖ Rake leaves and compost.

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**USE PESTICIDES WITH CARE.
READ LABEL DIRECTIONS. FOLLOW ALL SAFETY PRECAUTIONS.
PROTECT THE BAY. USE PESTICIDES AND FERTILIZERS WISELY**

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