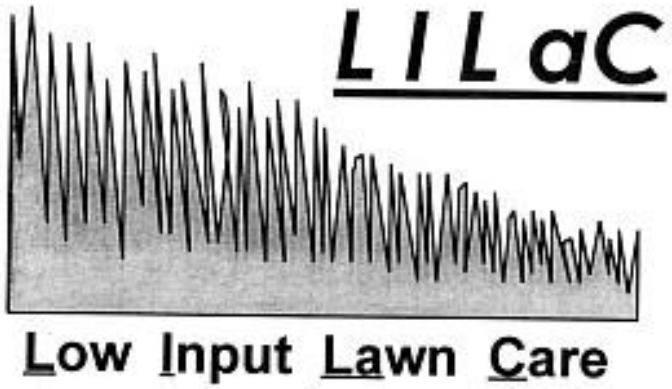


UNIVERSITY OF MINNESOTA
Extension
SERVICE

LILaC, an acronym for **L**ow **I**nput **La**wn **C**are, is a lawn care approach that embraces strategies and practices which seek to reduce the inputs of product, expense, time and labor required to maintain a healthy, environmentally functional lawn area. It is not: a recipe for a specific lawn care practice, strictly a natural or organic lawn care program, or a *no* maintenance program.

Potential benefits from **LILaC** include: cost savings due to less lawn care product needed, conservation of water resources, and reduced labor inputs. It should be noted that for some, maintaining a lawn provides a great deal of personal satisfaction, therapy and pleasure. However, even under high maintenance lawn care programs, prudent use of lawn care products and practices is an environmentally responsible course of action.

Potential disadvantages of more modest growth rates associated with less vigorous species and varieties include: 1) the possibility of increased weed encroachment into the lawn; 2) ***un***suitability to lawns receiving high levels of traffic and wear; and 3) the tendency to more slowly recover from disease, insect and environmental stress injury. Initially, significant effort may be required to convert a lawn to a lower maintenance program. While these need not become deterrents to developing a **LILaC** program, they may be important considerations in deciding to change.

Evaluating your lawn for LILaC

Successful transition to lawns needing fewer maintenance inputs requires careful evaluation of current conditions and recent maintenance history. Problems such as soil compaction, excess thatch, shade, poor drainage, weeds and other pests should be evaluated and any necessary corrective actions taken. Also, species and varieties of lawn grasses adapted to lower water and nutrient inputs must be present. Otherwise you must be willing to introduce appropriate grasses. In addition, a soil test is recommended at this time to determine soil nutrient levels.

Knowing what grasses are present can be difficult to determine. Here are some hints to help in determining the grasses you have present:

1. If your lawn is older than 30-35 years, chances are it consists mostly of the common type Kentucky bluegrass varieties along with some fine-leaved fescues; especially in the more shady areas.

2. If your lawn has been established by seeding or extensively overseeded with mixtures designed for “general purpose lawns,” chances are Kentucky bluegrasses, fine-leaved fecues and possibly some perennial ryegrasses will be present.

3. If your lawn has been established or overseeded with grass seed blends for “premium or elite” lawns, chances are that most of the lawn will be a blend of several improved Kentucky bluegrass varieties along with some perennial ryegrass. These grasses would usually be considered better adapted to higher maintenance and do not adapt

well to low maintenance programs. Introduction of lower maintenance varieties would be needed to convert the lawn to a **LILaC** program.

4. If your lawn has been established by sodding, chances are that most grasses present will be improved Kentucky bluegrasses. More recently, sod blends have consisted of some higher maintenance varieties and some more tolerant of lower maintenance, thus allowing the sod to adapt to a variety of lawn care programs. In this situation overseeding with some even lower maintenance varieties may be desired.

If you are uncertain about the level of lawn care you are presently providing, see Table 1 for a summary of lawn care levels and a review of the grass species and varieties best adapted to the various care levels.

To better understand the prudent and timely use of lawn care products, it is helpful to briefly review the growth cycle of lawn grasses. The grass grown for lawn use in this area are perennials known as ***cool season grasses.*** Turfgrasses adapted to southern states are perennials known as ***warm season grasses.*** Cool season grasses have growth peaks in the spring and fall, indicating their response to the cooler conditions at those times of the year. The warm season grasses have a peak growth period during the summer months, indicating their response to warmer conditions.

During the short days and cool temperatures of late fall and early spring, mature shoots of cool season grasses go through a permanent biological change. That is, the shoots cease to produce leaves and "switch" over to shoots that will produce flower stems during the long days and warm temperatures of late May through June. In fact, most of the shoot

Grass plant growth

Table 1. Levels of Home Lawn Care

Lawn Care Level	Amount of Watering	Range of Mowing Heights	*Pounds of Fertilizer Applications	**Timing of Fertilizer Applications
Very Low Maintenance (see grass types under low maintenance)	None	3+	0	____
Low maintenance: Suitable grasses are common Kentucky bluegrass varieties & fine-leaved fescues (e.g. creeping red, chewings and hard fescue)	Little to none	2 ½" – 3"	1	September
Medium maintenance: Suitable grasses are most Kentucky bluegrasses & fine-leaved fescues	Some	2" – 3"	2	mid to late August to early September, mid-October
High maintenance: Suitable grasses are the improved bluegrass varieties & turf-type perennial ryegrasses	Regularly	1" – 3"	3 or 4	Late May to mid-June, mid-August, and mid-October mid-May to mid-June, mid-August, mid-September, and mid-October

* If clippings are left on the lawn, one fertilizer application can be eliminated from the high maintenance program. Soils with high organic matter levels, as indicated by a soil test, will also need less nitrogen (N) per year due to the reserve N supply contained in the organic matter. N will be slowly released for plant use as the organic matter further breaks down over time.

** Earlier times should be used in northern parts of the state, while times can be used in the southern areas.

growth that occurs during this latter period is the production of flower stems but they often go unnoticed due to regular mowing.

Once the grass shoot has completed its flowering cycle, it dies along with many of its associated roots. Since these dead shoots are continually being replaced by new ones and by those that were not mature enough to flower, there is little detectable difference in the lawn other than it may appear somewhat thinner by the end of June and early July. Natural rejuvenation of the lawn area begins again by mid July or early August and the process starts over.

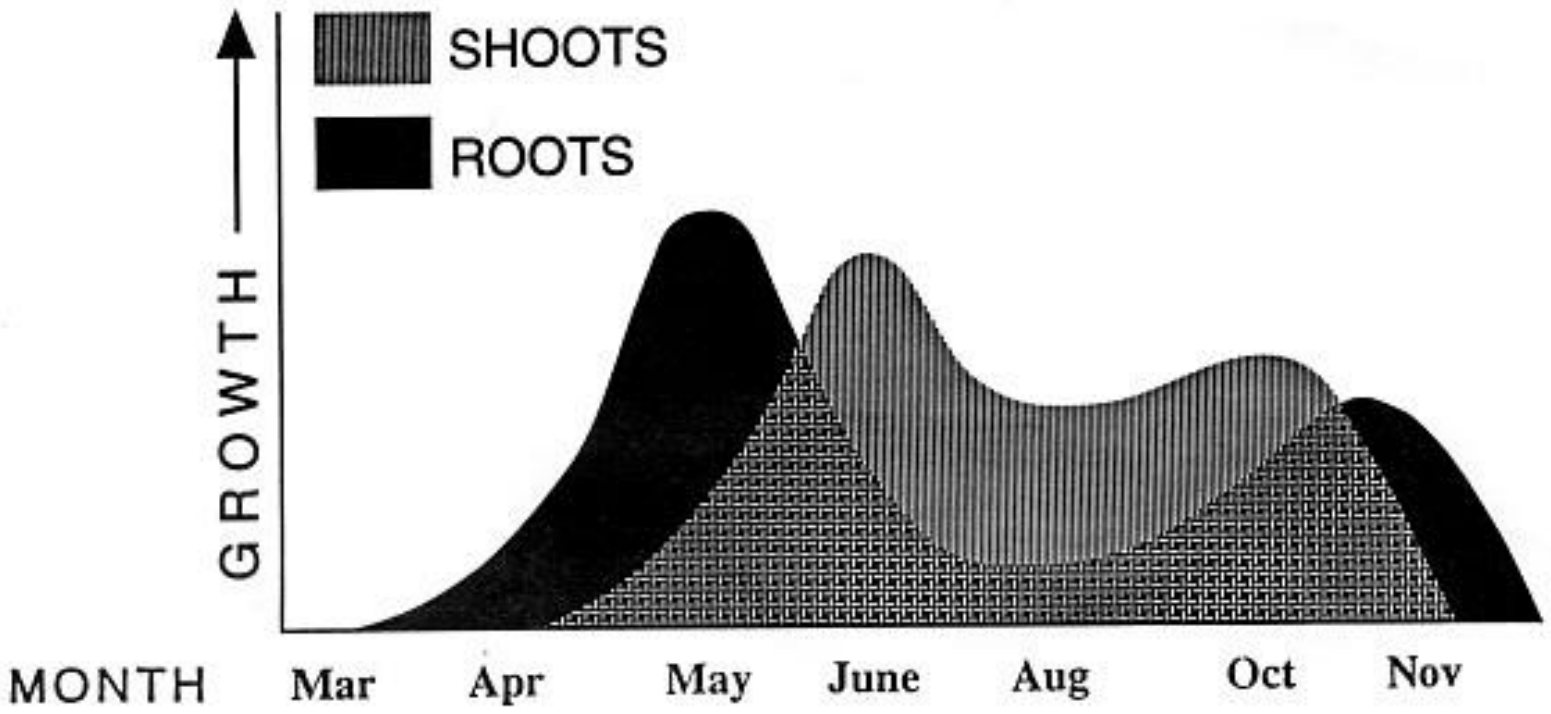
In cool season grasses, most root initiation and growth occurs during the cool weather of spring and fall. It should be noted that root growth begins and peaks in activity **before** peak shoot growth activity in the spring (See Figure 1).

While there is some shoot growth activity during the summer months (providing that the grass plant is not in summer dormancy), root growth is very slow. Finally, there is another activity period in the fall.

Maximum root growth and maximum shoot growth **do not** occur at the same time and may be considered somewhat antagonistic to each other. Adjusting turf management practices to optimize growth of either roots or shoots is a significant factor in establishing and maintaining a healthy turf, especially as lower inputs are considered.

Renovation to a Lower Maintenance Lawn

Introducing lower maintenance turf varieties into an existing lawn is usually done through some type of overseeding practice. Selecting grass varieties adaptable to lower input levels is the first important step in making the transition to a lawn adaptable to lower inputs.



Lawn grasses more tolerant of lower moisture and fertility levels include the common type varieties of Kentucky bluegrass and the fine-leaved fescuses (i.e. creeping red fescue, chewings fescue and hard fescue). Some examples of common type bluegrass varieties include Kenblue, Park, South Dakota Certified and Newport. It should be noted that many of the newer bluegrass varieties available may also do acceptably well once adapted to lower input levels. Examples include: Rugby, Parade, Touchdown, Ram I, Nugget, Sydsport and Monopoly.

In addition, many fine-leaved fescue varieties are adaptable to lower water and fertilizer levels. Because there are many more seeds per pound of bluegrass than fine-leaved fescues, slightly higher seeding rates are required when using blends and mixtures that include fine-leaved fescues.

The preferred time for lawn overseeding/renovation is from mid-August to early-September. The second best time is usually early spring as the lawn is beginning to turn green and grow. The basic steps for renovating a lawn are outlined in the table on the following page. These methods are also appropriate when introducing different species and varieties into a lawn.

Watering

Proper watering practices of turf can play a major role in the grass plant's ability to tolerate and resist stress and pest problems. Approximately ¾ to 1-½ inches per week of water including rainfall are considered necessary during the growing season to keep lawns green.

Allowing cool-season grasses to go into a state of summer dormancy is one way to reduce the need for summer irrigation. Summer dormancy is a state of "plant rest" in common Kentucky bluegrasses that helps the plant survive extended periods of hot, dry conditions.

Cool season grasses should be properly conditioned in order to better withstand the dry and often hot conditions. As the summer stress period approaches, gradually reduce water supplies to the lawn. This will help condition the turfgrass plant to drier conditions and help increase survival. Watering heavily prior to the summer stress period and then abruptly stopping the application of water leaves the grass in much more succulent condition and much less able to endure extended hot, dry periods.

During drought periods, applying ¼ to ½-inch of water approximately every 3 weeks on a heavier soil will help keep the grass plant crowns form dehydrating beyond a point of recovery and yet not bring the plants out of dormancy. Shorter intervals may be needed on sandy soils or during prolonged dry periods with high temperatures to achieve the same result. However, during prolonged and extreme conditions of drought and high temperature, some turfgrass death may still occur. Once cooler temperatures and natural rainfall return in late summer or early fall, regular irrigation practices can be resumed if needed. Table 2 summarizes proper conditioning of lawns to help them endure hot dry periods.

Table 2.

Practices to Increase Drought Tolerance
♦ Choose tolerant species
♦ Avoid excessive growth stimulation
♦ Maintain adequate potassium levels
♦ Raise mowing height
♦ Condition turf to drought
♦ Limit traffic

Overwatering can cause a number of problems for the grass plant. Soils that are too wet, particularly in the spring and fall of the year, can predispose the plant to some fungal disease problems, especially those associated with the root system. Keeping a film of moisture on the grass blade for long periods of time encourages the development of some fungal diseases. Hence, watering early to mid-afternoon is generally a better practice than watering too late into the evening. Overwatering is unhealthy for the turfgrass and is wasteful of water.

BASIC STEPS FOR RENOVATING A LAWN

Step	Options	Comments
1. Soil Test		Contact your County Extension Office for information
2. Weed Control	Physically pull, Broadleaf Herbicide Nonselective Herbicide (glyphosate)	For large or spreading weeds; won't kill all weeds. If weeds are primarily nongrasses. Kills most green vegetation; requires 5-14 days.
3. Soil Moisture Replenishment	If needed (especially in fall)	Soak soil to a depth of 6-8 inches; then allow the surface to dry until steps 4 and beyond can be done (may require 1-2 days).
4. Thatch Removal	Vigorous hand raking	Not practical for extreme thatch problem or large areas
	Vertical Mower	Can be rented or hired; can also be used to prepare seedbed (see below)
	Sod Cutter	Recommended for extreme thatch problem; can be rented or hired
5. Soil Preparation	Vigorous hand raking	For small sites with little vegetation remaining
	Aerification	3-5 passes with commercial aerifier; especially recommended if soil is compacted
	Vertical Mowing	Tines should nick surface to a depth of 1/8-1/2 inch.
6. Fertilize	Nitrogen (N) Phosphorus (P) Potassium (K)	½ pound of N per 1000 square feet; additional P and K as determined by a soil test
7. Seeding	Hand	Divide seed lot in half or quarters and seed in 2 or 4 directions. For small sites (less that 8 feet across); mix 1 part seed with 4 parts sawdust or a product like Milorganite.
	Rotary Spreader	Preferred method if mixed with sawdust or Milorganite
	Drop Spreader	Seed in 2 directions or overlap ½ way
	Slit Seeder	Equipment can be rented but requires skill; generally best done by a professional. Go over site 2-4 times.
8. Irrigate		Lightly to provide good seed-soil contact; then, water lightly twice daily to rewet soil surface (if surface remains moist, may require watering only once or not at all). Don't allow soil to become soggy.
9. Mow		When 3 ½ - 4 inches tall, mow to 2 ½ inches with sharp mower; as lawn thickens, gradually lower mowing height until desired grass height is reached.

Mowing

Regular mowing with a sharp mower blade at the proper mower height will help keep the grass growing vigorously and maintain adequate density to thoroughly cover the soil surface. Continually scalping the turf will seriously weaken the grass plants leaving an opening for weed invasion.

For most lawn uses, mowing at a height of 2 ½ to 3 ½ inches will provide good quality turf. This slightly higher height will help screen out light to the soil surface giving some weed control benefit. It will inhibit the establishment of those weeds such as crabgrass that need light to germinate. Also, a higher height of cut will encourage a slightly deeper root system that allows roots to gather moisture and nutrients from a larger soil volume. This can give the grass plants a greater degree of stress tolerance. Where grass has become very long (e.g. as during extended rainy periods), it is better to lower the height gradually rather than cut it back all at one time. This will help avoid any unnecessary stress on the turfgrass plants.

Grass clippings should be returned to the lawn whenever possible. They do not contribute to thatch build-up. Grass clippings are a valuable organic source of nutrients, especially nitrogen. As clippings decompose, nutrients become available for use by the grass plant. In fact, yearly nitrogen applications may be reduced by 1/3 to ½ when grass clippings are returned to the lawn.

Mulching mowers and "mulching" attachments for existing mowers can reduce the clipping size thus increasing the rate at which grass clippings decompose. Mowing on a regular basis with a sharp mower blade will usually produce clippings that decompose fairly quickly without further size reduction. However, clippings should be removed if they form clumps that sit on top of the grass after mowing. Increasing the mowing height by ½ inch during the summer can improve the grass plant's ability to tolerate stress.

Fertilizing

The goal of any fertilization program is to compensate for nutrient deficiencies in the soil that are needed by the grass plant to sustain healthy growth and remain competitive against disease, insect and weed invasion. While phosphorous and potassium are required for a healthy lawn, it is nitrogen that is required in largest amounts by the grass plant.

Few soils have enough natural nitrogen available to maintain adequate turfgrass quality and recuperative ability throughout the growing season. Nitrogen shortages can lead to very slow growth, yellowing of the plants, thinning of the turf, weed infestation and increased incidence of some diseases. However, overfertilizing with nitrogen can lead to excessive shoot and leaf growth, reduced root growth, low plant carbohydrate (food) reserves, increased susceptibility to environmental stresses and some diseases. In fact, in lawns containing grasses adapted to lower water and nutrient inputs as described earlier, overfertilizing with nitrogen and/or overwatering results in a decline in health rather than improvement.

Nitrogen contained in fertilizers may be derived from either inorganic or organic sources, and is either quickly or slowly available for the plant to use. Inorganic fertilizers such as urea are all water soluble or *quick-release* nitrogen sources. That is, nitrogen becomes available for plant use soon after water is applied. The response is quite predictable and results are often visible in 5-7 days. However, the effects are relatively short lived. On sandy soils, high application rates of these products combined with high irrigation or rainfall amounts will likely result in higher nitrogen losses due to leaching. Leaching is the movement of water and nutrients through the soil beyond the turfgrass root zone.

Organic fertilizer products, natural or synthetic, are those containing carbon in their chemical structure. Nitrogen from natural organic sources becomes available only after the product begins to break down due to soil microbial or chemical action. These are considered *slow-release* nitrogen sources because

nitrogen is gradually released to the soil solution and becomes available for plant use over a longer period. Soil temperature and moisture are key factors governing the microbial activity and thereby the nitrogen release. Compared to quick-release sources, these have a lower leaf-burn potential and can be applied at slightly higher rates, less often, and without damaging the turf.

The primary synthetic organic fertilizer product is urea. It is considered a quick-release nitrogen product. Urea has been further processed and/or combined with other materials resulting in products with more or less of a slow-release characteristic. Nitrogen release is dependent on soil chemical and/or microbial action. These slow release urea based fertilizers have a fairly low leaf burn potential and can be applied at slightly higher rates and less often than quick-release nitrogen sources.

A soil test will determine whether adequate levels of phosphorus and potassium are present to sustain a healthy lawn and if not, how much to apply. Unless otherwise indicated by soil test, lawn fertilizers should contain nitrogen, phosphorus and potassium (N, P, K) in ratios of 4-1-2 or 3-1-2 respectively. Where soil tests indicate ample phosphorus in the soil, the middle number could be dropped to zero. Table 1 indicates the proper timing and number of applications for lower maintenance lawns. Remember, making a transition to a lower nutrient requiring lawn is a gradual process and may require the introduction of lower maintenance grass types. This is especially true if the existing lawn thins out significantly during the transition process.

Pest Control

Properly maintained and healthy turfgrass will tolerate the presence of low levels of pest population without suffering permanent damage. Healthy turfgrass usually recovers more quickly from insect or disease infestations. However, there may be times, even in healthy lawns, where some pest control is needed to prevent significant turf damage. Pesticides should be applied only to those areas where the pest is evident rather than to the total lawn area.

The first step in responsibly using any pesticide product is to follow the label directions exactly as stated on the product container. The label provides necessary information regarding proper product application and container disposal procedures.

Before applying insecticides and fungicides to a turf area, be sure that the apparent damage symptoms are being caused by an insect or disease. Accurate diagnosis may require the assistance of a trained turfgrass professional. If an insect or disease pest is found to be causing serious turf damage, then a proper control method can be selected. This may or may not involve the use of a pesticide. Weeds should also be identified to determine whether there is a need for herbicide use. The presence of certain weeds may be indicative of other cultural conditions that also need to be corrected.

Proper timing of pesticide applications is crucial to their overall effectiveness against the pest and to minimizing adverse environmental impacts. For example, when weeds or insects are quite large and mature, pesticides may not be that effective. Likewise, treating disease problems at very early stages of infection is more prudent and may require less total fungicide than attempting treatment of large, heavily infected areas.

Normally, it is only under extraordinary conditions that a fungicide is recommended for a home lawn situation.

Proper timing can also relate to the time of year when a pesticide may be most effective. For example, fall is the best time to control perennial broadleaf weeds. In the fall (mid-September to early October), these plants are actively growing and will more readily take up the herbicide. Since most other landscape plant material is either going dormant for the winter or has been removed from the garden, there is usually less chance of off-target plant injury. However, that does not give one license to be careless when applying a weed control product.

Sometimes it is necessary to "water-in" a pesticide treatment for it to be most effective. Pre-emergent types of herbicides, typically used for controlling crabgrass and other annual weedy plants, must be moved into the soil surface to be effective. Their mode of action is such that it affects the seed as it begins to germinate but before it emerges from the ground. Depending on the soil type, ¼ to ½ inch of moisture should be applied following application of these products (This is about 1 to 2 hours of watering with most common lawn sprinklers. Automatic irrigation systems may need to be adjusted accordingly).

Materials used for controlling soil and thatch inhabiting insects usually require some type of watering following application to move the product into the thatch and soil area. This puts the product where it will be the most effective, reduces the chances of it being carried away in runoff and potentially reduces exposure to the material. While thatch can facilitate tie up of these materials and potentially reduce their effectiveness, it can also shorten their persistence in the environment.

In the case of postemergent broadleaf herbicides, it is usually unnecessary to thoroughly drench an area with the herbicide solution to achieve satisfactory weed control. This may be wasteful of both water and herbicide as well as moving the herbicide beyond the plants and into the soil where it may be more prone to leaching or affect non-target plants. Spraying enough to wet the foliage but not run off from the plant is usually sufficient to be effective.

Where only a few weeds exist or are confined to a few small areas, hand removing or **"spot"** treating with an appropriate herbicide may be the most appropriate control measure. Application of a preemergent herbicide may only need to be done in those areas where crabgrass was found last year. These include such areas as those bordering sidewalks, driveways or curbs. Crabgrass may not be a problem or even present in the remaining lawn area where it is cooler and the other lawn grasses are more competitive.

It is also important to remember that an occasional weed is not uncommon in lawns. Hand removal and being a little more tolerant of a few "weedy" plants while maintaining an otherwise healthy lawn can go a long way to reducing weed control inputs.

Once pest problems have been reduced, proper lawn care practices will encourage vigorous, healthy grass plants, making future pesticide applications minimal or even unnecessary.

While not all of these **LILaC** practices and strategies will fit into everyone's lawn care program, incorporating some or all of them will hopefully reduce expenses, products, time and labor necessary to maintain quality, functional lawn areas that enhance our neighborhood and communities.

If you think that a **LILaC** program might be for you but still have some questions, contact the University of Minnesota Yard & Garden Line at 612-624-4771, or your county Extension office.

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