

Factsheet

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(replaces OMAFRA Factsheet *Lawn Establishment*, Order No. 93-107)

A lawn is an integral part of the urban landscape, providing functional, therapeutic, recreational and aesthetic benefits. A lawn that is well constructed in the first place will be easier to maintain. The work and cost of maintaining a well-constructed lawn are considerably less than for a poorly constructed lawn. The saying, "a house is no stronger than its foundation" applies equally to a lawn.

SOIL

Your first consideration in lawn preparation should be to ensure you have good topsoil. Good-quality topsoil is the foundation of a good lawn.

In general, a sandy loam-to-loam soil is preferable, but most grass species grow satisfactorily in many soil types. If you do not have sandy loam-to-loam soil, you can modify your existing soil or subsoil to improve its physical properties significantly.

Potential soil amendments include animal manures, peat and composted organic materials:

- Well-rotted manure is an excellent source of organic matter but does contain weed seeds.
- Sphagnum peat moss is the preferred peat source because it

is less decomposed and persists over a longer period of time than other peat sources. Peat moss should be moistened to aid incorporation into the soil.

- A good-quality compost should resemble a dark topsoil and have a crumbly texture. It should be free of large pieces of wood, garbage and other objects. If the organic matter used is not well decomposed, you may need to add additional nitrogen to supply the needs of the soil micro-organisms for the decomposition of the organic matter.

Adding organic matter will benefit the soil by:

- improving the structure of heavy soils so that it is easier to till and aerate them
- improving drainage
- increasing the water-holding capacity of coarse-textured soils such as a sandy loam
- helping provide a proper medium and food supply for soil micro-organisms
- supplying plant nutrients such as nitrogen, phosphorus and sulphur during decay
- helping maintain soil fertility by preventing leaching of plant nutrients

When adding large volumes of organic matter to significantly improve the existing soil, spread a 2.5-5-cm

layer of peat moss, well-rotted manure or compost over existing soil, then thoroughly mix it with the soil to a 15-cm depth to avoid problems with layering between the soil and the organic material.

Soil tests

Test your soil before establishing your lawn to determine its pH, lime, phosphorus and potassium requirements. Sample soil by using a soil sampling tube or a shovel (Figure 1). Take the sample to a depth of 15 cm, taking approximately 15-20 cores from the entire area to be established. Place the soil in a clean plastic pail and mix well. From this larger sample, take a 500-g sample to send to a soil-testing laboratory. A list of accredited soil-testing laboratories is available from any regional OMAFRA office or at www.ontario.ca/crops (Laboratories for Soil Analysis).

Where a soil test is unavailable, a general recommendation of 0.5 kg nitrogen, 1 kg phosphate and 1 kg potash per 100 m² can be applied to the seedbed. Working the phosphorus and lime (if required) into the soil to a depth of 10 cm is ideal. When using a rototiller or similar equipment, spread lime, fertilizer and organic matter together on the surface and rototill them in. A rototiller will thoroughly mix all the materials and work them into the soil to the preferred depth.



Figure 1. Soil sampling tube and shovel.

GRADING AND LEVELLING

On every lawn there are at least two fixed grade levels: (a) the grade line of the house; and (b) the grade line of the curb, sidewalk, or trees. When grading, consider the harmony and adaptation to an adjacent property so that the home is distinctive but not conspicuous.

The most natural grade is one where the lawn slopes gently from the house on all sides. The slope should allow surface water to run off gradually without causing erosion. The desirable slope is a fall of 2 cm/m.

Avoid terraces and steep slopes if possible because establishing and maintaining grass on them is difficult, and mowing them is arduous. However, if the slope away from the house drops more than 6 cm/m, the construction of terraces with retaining walls is advisable. Terraces are more attractive than steep slopes and are easier to maintain. Sometimes, if the grade and slope permit, gently sloping banks can also be an alternative.

Installing tile drains before completing the grade is desirable if you cannot obtain good drainage

otherwise. Tile drainage makes soggy places drier, aids in removing excess rainfall quickly and improves soil aeration. Lines of tiles 7-10 cm in diameter placed 3-5 m apart and 50 cm deep with 1%-2% fall (1-2 m in 100 m) usually provide adequate drainage. The benefit of tile draining can be reduced by covering the tiles with a fine-textured basement subsoil. The more compact the subsoil is, the closer the lines of tile should be. Connect the tile to an adequate outlet, and screen the open end of the tile system with wire mesh to prevent birds, mice and rats from nesting in it. The outlet for the tile system may connect with a storm sewer or a downspout drain or simply empty into the street. Approval by city authorities is necessary for some types of outlet installations. Where there are no storm sewers, connect a sump at the edge of the lawn and to the tiles.

When planning a new house, consider the lawn as well, because it is an essential feature of the surroundings. Make arrangements for the disposal of the subsoil from the basement excavation, and save the topsoil separately. Do not cover the topsoil on the lawn with the subsoil excavated from the basement, or cover the topsoil with the subsoil during grading and levelling operations.

If significant grading and levelling are required, scrape the top 12-15 cm of the soil aside and save it for replacement. Unfortunately, when a house is built, the topsoil is frequently hauled away and the lawn area is covered with subsoil from the excavation. This subsoil lacks aeration and usually forms a layer that impedes drainage. Enough good topsoil must then be saved or

purchased to cover the area to a depth of 12-15 cm.

SEEDBED PREPARATION

Start the final preparation of the seedbed 2 or 3 weeks before seeding. Control perennial grass weeds such as quackgrass and creeping bentgrass prior to establishment by tilling. Roll and rake the area to be established to produce a firm, level seedbed. On large areas, drag a heavy plank or iron mat back and forth to achieve the desired result. At seeding time, no large lumps should appear on the surface.

Allow newly graded soil to settle before seeding. Watering helps settle loose soil. It also reveals low areas and provides adequate moisture below the seedbed. Roll the area for final smoothing. Rake out high spots and fill in depressions. The seedbed should be firm but friable. If walking on the area makes marks deeper than the soles of shoes, it is too loose and fluffy. Do not roll the seedbed excessively. This can cause compaction that will inhibit the root system.

Since a firm seedbed promotes seed germination, roll the seedbed immediately after seeding, when the ground is dry so that the soil will not stick to the roller. For best results, water the ground thoroughly within 24 hr after rolling. Stand at the side with the hose nozzle to avoid dragging the hose over the newly seeded area.

Home lawns are generally seeded with a mixture of turfgrass species so that one type is available to grow in full sun and another in the shade. The turfgrasses most commonly used in lawn mixtures are Kentucky bluegrass, fine fescue and perennial ryegrass. Tall fescue is recommended in areas that are prone to drought.

TURFGRASS SELECTION

The selection of turfgrass species and cultivars will depend on the intended use of the lawn or turf area. Different turfgrasses are recommended, depending on the intensity of maintenance and expectations of quality. Varying climate, soil and shade conditions are also factors that affect the choice of seed mixtures.

Turfgrasses may be seeded alone, but, for the average lawn, mixtures of suitable grasses, each with a definite purpose, are most commonly used. Depending on conditions, one turf species will perform better than another. Table 1 summarizes the appropriate seed mixtures for most typical turf sites. By adjusting the proportion of the various grasses, the mixtures may be prepared for different locations and conditions.

Kentucky bluegrass forms the basis of most lawns because of its dark green colour, medium-fine texture, uniformity, low growth habit, good

spring green-up, good low temperature and traffic tolerance. It grows under a wide range of conditions but prefers sunny locations and well-drained soils. If a high-quality lawn is desired, Kentucky bluegrass should make up 50%-75% of the seed mixture by weight. Where irrigation is restricted, bluegrasses become dormant but will usually resume active growth after the drought stress ceases. Kentucky bluegrass is slow to establish, and other quick-growing grasses are used in combination with it. Perennial ryegrass is frequently mixed with it to provide quick cover on the lawn.

On poor, sandy or acidic soils, or in shady places, Kentucky bluegrass may not thrive as well as other grasses. On such soils, include fine fescues in the mixture. Fine fescues (creeping, chewings, hard) have a fine leaf texture and can adapt to a wide range of soils. These grasses have the lowest fertilizer requirements of any of the cool-season grasses. For tough, hard-wearing turf, use a mixture of Kentucky bluegrass and perennial ryegrass.

Table 1. Seed mixtures.

Species	Heavy/Medium Soils*	Light Soils
Irrigated soils		
Kentucky bluegrass	60%-75%	40%-50%
Fine fescues	15%-25%	40%-50%
Perennial ryegrass	10%-20%	10%-20%
Non-irrigated soils		
Kentucky bluegrass	35%-45%	55%-60%
Fine fescues	45%-55%	55%-65%
Perennial ryegrass	10%-20%	10%-20%
Shade conditions		

Dry	Fine fescues or a suitable mixture of fescues with shade-tolerant Kentucky bluegrasses, perennial ryegrasses or tall fescues
Wet	Rough bluegrass
Overseeding	100% turf-type perennial ryegrass

* expressed as a percent of the seed mixture

Turf-type perennial ryegrasses are quick to germinate, tolerate close mowing and are highly adaptable to most soil types. Several turf-type perennial ryegrass cultivars contain endophytes that increase resistance to leaf-feeding insects such as chinch bugs, sod webworms and billbugs. Turf-type perennial ryegrasses are resistant to necrotic ring spot, which has become a serious disease problem in Kentucky bluegrass lawns. Turf-type perennial ryegrasses are also excellent for overseeding purposes. Perennial ryegrass, however, is the least winter hardy of the cool-season turfgrasses, and winter will kill it in some areas of Ontario.

Turf-type tall fescues have recently been introduced and are gaining popularity due to their excellent drought and salt tolerance. This grass is being used as a low-maintenance turfgrass for boulevards and roadsides and to a lesser extent for sports fields. Tall fescues perform best when used alone or in a mixture with approximately 10% Kentucky bluegrass. Several turf-type tall fescue cultivars contain endophytes and hence have increased resistance to leaf-feeding insects. However, tall fescues are prone to low temperature injury in some areas of Ontario. In areas where they are not winter hardy, they will thin out into unsightly clumps.

Depending on preference, 5%-10% white clover can be added to the lawn seed mixture. The advantage of

white clover is its nitrogen-fixing capability. The disadvantages of clover are its patchy appearance and the tendency to stain clothing and shoes. It attracts bees and may die out in the winter.

The use of cheap seed is a poor economy. Such mixtures may be low in germination, contain weed seeds, chaff and other foreign material and may rely on poorly adapted species. Many lawn seed mixtures contain annual ryegrass seed because it is an inexpensive turfgrass seed that establishes itself very quickly. Annual ryegrass is not suited for a lawn mixture. It does not blend well with Kentucky bluegrass because of its light green colour and coarse texture. In addition, annual ryegrass is an annual that is killed over the winter, leaving bare areas in the lawn. The mixtures given in Table 1 are seed mixtures that can be modified to suit particular conditions.

TIME OF SEEDING

The best time to establish a lawn from seed is late summer and early fall (mid-August to mid-September) in southern Ontario. During this period, soil moisture and temperature conditions are optimal for germination and establishment. There is also less competition from germinating weeds in the fall. Make sure that seeding is done early in the fall so that the grass is well established before winter. The plants are then well rooted and more drought- and heat-tolerant the following summer.

Seed the shady areas in the fall for best results. Trees will have shed their leaves by then, so plenty of light is available for the new growth. The grass also gets

off to an early start in the spring before the trees leaf out.

Spring seeding should be done as soon as the ground can be worked. Slow, irregular germination may result if the seed is sown when the soil is too cold and damp. There is also strong competition from germinating weeds during the spring. When practical, wait until weed seeds germinate, work the land to kill them and then sow the grass seed.

Establishing turfgrass by seeding during midsummer is difficult due to high temperatures and stress conditions. Seeding can only be done successfully in midsummer if irrigation is available to keep the seeded areas well supplied with moisture.

If spring or fall seeding is not possible, another alternative is dormant (late fall or early winter) seeding, which is done at a time when soil temperatures are too low to allow grass seed to germinate. The seed will germinate in the spring when soil temperatures warm up. Winter conditions that are necessary to ensure the success of dormant seeding are:

- low enough temperatures to inhibit seed germination
- continuous snow cover
- minimum erosion

A common problem with dormant seeding is that the seed is washed away by surface runoff in the spring. Stabilizing the seedbed with a suitable mulch helps ensure the seed stays in place. The difficulties associated with dormant seeding make it a less-favoured option.

RATE OF SEEDING

After the preliminary work has been done, be sure not to skimp on seed. Light seeding rates result in a thin, patchy lawn. There is considerable variation in seeding recommendations because the seeds of grasses vary in size, weight and growth. Follow directions on the seed label or use the general guidelines listed in Table 2. Generally 15-20 seeds per 2.5 cm² is an adequate seeding rate.

Table 2. Seeding rates.

Kentucky bluegrass	0.5-1.0 kg/100 m ²
Fine fescues	1.0-3.0 kg/100 m ²
Perennial ryegrass	2.0-4.0 kg/100 m ²
Tall fescue	2.0-3.0 kg/100 m ²

Use a seeding rate of 2-3 kg of seed per 100 m² where Kentucky bluegrass forms a high percentage of the mixture. Sow only seed with a high germination rate. For small areas, the rate of seeding can be increased slightly. For large areas, 100-150 kg/ha is a good general rate of application.

METHOD OF SEEDING

Small areas are usually seeded by hand, with the seed distributed evenly. The best time to seed is early morning or late afternoon when there is no wind. The best practice is to divide the seed and sow half in one direction and the other half at right angles to it (Figure 2). Another method is to sow in strips about 1-2 m wide. For small areas, a better seed distribution can be obtained by mixing the seed with an organic fertilizer. The seeds stick to the organic particles and the greater bulk can be applied more uniformly. A good distribution can be obtained with the common gravity-type fertilizer spreader.

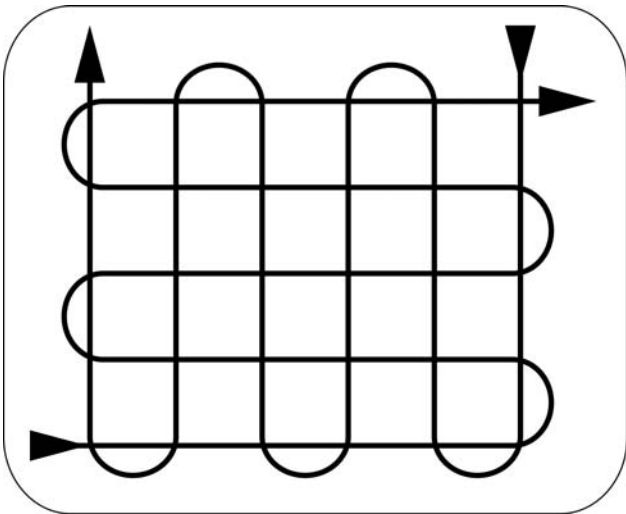


Figure 2. This drawing shows the best seed distribution pattern. Half the seed is sown in one direction and the other half at right angles to it.

After seeding, rake the soil lightly to cover the seed to a depth of 2-5 mm. Raking in one direction only (instead of with a back-and-forward motion) prevents pulling the seeds into channels or ridges.

After the seed is covered, roll the area to firm the soil around the seed. This encourages rapid, uniform germination. Keep the roller dry so that it will not pick up seed. Roll newly seeded areas four times:

- immediately after sowing
- after germination, to press the heaved ground down and firm the roots
- after the first cutting
- the following spring, to press the frost-heaved seedlings back into the ground.

Water newly seeded areas frequently to keep the seedbed moist until the seed germinates and the seedlings become established. Apply only a fine spray to avoid uncovering the seed. Keep the area uniformly moist but not saturated until the plants

are established. This may require watering or misting the seed several times a day.

APPLYING A MULCH AFTER SEEDING

Mulch is not necessary but does help ensure uniform, rapid turfgrass germination and establishment. The application of a mulch is advantageous when seeding steep slopes (to prevent soil erosion) until the turfgrasses are established. It also provides protection for germination and early seedling growth. Straw, burlap or landscape fabrics can be used as mulching materials. If using straw, use approximately two bales per 100 m². The mulch should be removed when seedlings reach the height of 4 cm.

MOWING NEWLY SEEDED LAWNS

Mow a newly seeded lawn when the grass is approximately 1-2 cm higher than the intended mowing height. Make sure that the mower blades are sharp or the grass seedlings will be pulled out of the soil. Mowing is important, as it stimulates tillering and rhizome production, thickening the establishing turf.

A light application of fertilizer can be applied to the new seeding approximately 4-6 weeks after germination to encourage turf density.

SODDING

Sodding provides an instant lawn and is preferred in the following situations:

- when a lawn is desired within a short time
- for the establishment of a terrace or steep slope where severe soil erosion would occur if the disturbed soil were left unprotected

- for areas where seeding is difficult because of foot traffic or heavy shade
- in the midsummer or late fall when conditions are not suitable for seed establishment

New roots are initiated primarily from crown and rhizomes of Kentucky bluegrass plants. New roots from sod with a thin soil layer will rapidly penetrate into the soil beneath, and the sod will become firmly established within a couple of weeks.

Soil preparation for sodding is similar to that for seeding. The area to be sodded should be level and firm. With sodding, only a new root system has to be established. Lay sod almost immediately after it is delivered to the site. Excessive heating within the sod roll occurs quickly during the middle of summer, and severe damage can occur within 12 hr. Usually a complete fertilizer that is high in phosphorus is worked into the top 7 cm of the soil prior to laying. The sod rolls are laid end to end in a staggered pattern. Avoid stretching the sod because it shrinks when it dries and leaves gaps. These gaps are perfect sites for annual weed grasses to germinate.

After laying the sod, roll the sod to ensure good contact between the sod and the soil beneath. During the heat of summer, especially July and August, irrigate the sod within 1 hr of being laid. If the sod is allowed to dry, the root system becomes injured and the plants desiccate and die. Before laying the sod, water the soil lightly. After laying the sod, water it every 2 or 3 days in the early part of the day to keep the soil moist until the sod is rooted, which usually takes 2 weeks. Avoid overwatering. If sodding in the middle of the summer, irrigate the sodded area lightly at noon each day for 10 days to 2 weeks after sodding. Sod laid during early spring and late fall will require less watering after laying.

When the sodding is complete, use the same mowing height and frequency as for the established lawn. Fertilizer is usually not required for 3-4 weeks after laying and should then be applied as for a mature lawn after that. Keep traffic off the sod for 3-4 weeks after laying to ensure that the sod is firmly rooted.

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FOR YOUR NOTES



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