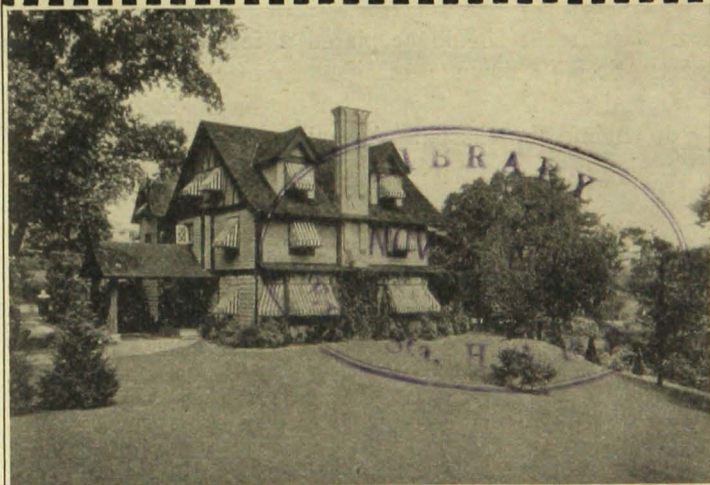


# Making the Home Lawn

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## UNIVERSITY OF MINNESOTA

### AGRICULTURAL EXTENSION DIVISION

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**I**N establishing a lawn one should think ahead of the actual date of planting and plan the process so that each step may be performed in logical sequence and far enough beforehand to insure the best results.

Before the actual construction of the lawn is begun, it is important to determine how the lawn will be fertilized. If part of the fertilization is to be by the application of compost, making a compost pile about a year before the fertilizer is needed is the first important step. Fertilizing with compost is one of the best methods of feeding the lawn and by its use a good lawn can be obtained without the expensive deep preparation of soil.

### GRADING AND DRAINAGE

Grading is the first step in the actual construction of a lawn and means more than the addition of a few inches of soil in any place. The top soil should first be removed and set aside until the grading is completed; then it should be spread over the newly graded places. This is necessary to obtain a good stand of grass on most soils in Minnesota.

If the soil is wet it should be tile drained. Lines of 4-inch tile should be laid so as to intercept and draw off the seepage. In most cases the lines of tile should be placed 2 feet below the surface, 20 feet apart. Seepage down a hillside can often be intercepted by a line of tile laid on the impervious layer that is holding the water from soaking down into the subsoil. A shallow ditch, grassed over, along the upper edge of the lawn will help to turn surface water away from the lawn.

### PREPARING THE SOIL

For best results, the preparation of the soil should be started several months or a year before the sowing. However, a good lawn can be secured by a shorter preparation. The important consideration is to apply a large amount of decaying organic matter. A cubic yard of manure for 1,000 square feet of lawn will suffice, but more could be used to advantage. If the fertilizer is applied only a short time before the seed, it should be well rotted; if applied several months before the seed, fresher manure may be used. The fertilizer should be plowed or spaded into the soil at the same time destroying all tap-rooted plants, such as dandelions. Decaying organic matter worked into the soil greatly increases the water-holding capacity, which is very important from the standpoint of watering and of seed germination.

Because of the great capacity of peat to hold water, the addition of about two or more inches of it is desirable. Peat may be substituted for part or even all of the manure. However, it is preferable to use some manure, tho the amount may be reduced to one half or

even one fourth that indicated above. Peat should be finely pulverized and thoroly mixed with the upper four to six inches of soil. Its use greatly increases the germination of the seed.

If time for long preparation cannot be spared, a shorter period of preparation can be made to answer, especially if the soil is naturally fertile and in good physical condition. Recourse can be had to feeding later with compost. A better lawn will result if the soil is plowed or spaded over and weeds kept out by cultivation during the two or three months previous to seeding. It is possible to make a fairly good lawn by seeding almost immediately after spading or plowing, but weeds are more likely to cause trouble if this procedure is followed.

### SEEDING THE LAWN

The best time for seeding a lawn differs somewhat, depending on the kinds of grasses used, and on the soil and climate of the locality. Probably the best time in Minnesota is from the middle of April to the middle of May, while the next best time is late summer, providing the lawn is seeded by the first week in September. Later than that is not desirable. A lawn can be seeded any time during the summer, but greater care in watering is necessary during the hottest weather to insure germination. When bent grass is to be grown from stolons, planting somewhat later than September 1 is as successful and often more so than spring planting.

Fall seeding is better from one standpoint, that is, the grass grows well and most weeds do not. In this climate, however, if seeding is delayed much after September 1, the grass does not get well started before cold weather sets in and winter-killing results. A lawn seeded in late fall is likely to become rough and full of pockets, owing to weather conditions at this time and in early spring. For these reasons a more even lawn usually can be obtained by early spring seeding. Of course, the irregularities of a lawn can be leveled by top-dressing, but most people are unaccustomed to this procedure.

After all the preparatory work has been completed, rake the ground to a final grade; then use a roller, lengthwise of the lawn. Next rake the surface to fill the depressions made by the roller, and roll in the opposite direction and rake again. Repeat these operations till a perfectly smooth surface is obtained; then divide the seed estimated to be needed into two equal parts. Broadcast one part either by hand or with a grass seeder, sowing strips in one direction as wide as can be readily covered by the method used. When the whole area has been covered, broadcast the other half of the seed at right angles to the direction of the first sowing, again covering the whole surface, strip

by strip. This will insure a more even seeding than if the sowing were done in only one direction.

After sowing, rake the lawn to cover the seed. At this time an application of compost may be applied evenly and raked over the seed, using one cubic yard for 1,000 square feet of lawn. Follow the raking or application of compost by rolling in both directions.

If the weather is at all dry after seeding, sprinkle frequently. A light sprinkling every day, preferably in the evening, will keep the surface soil moist enough to promote germination. At this stage the incorporation of humus in the lawn surface shows its importance. If the surface has sufficient humus, it will be easy to keep moist enough to insure germination. However, later watering, when the lawn is fully established, should be heavy enough to soak the ground to a depth of several inches at each application. Light sprinklings tend to keep the roots near the surface of the soil resulting in grass unable to endure periods of drouth.

In the late fall of the first season, whether the lawn was sown in spring or fall, it is advisable to apply a top-dressing. As its purpose is to fill up depressions and even the surface, it should be well raked.

### TYPES OF LAWN GRASSES

The standard lawn grass for the northern states is still Kentucky blue grass, tho red fescue and bent grass are important and have special uses. Kentucky blue grass (*Poa pratense*) will do well on a wide variety of soils but is not well adapted to those that are light and dry. Red fescue (*Festuca rubra*), better known by its variety name, "Chewing's fescue," is well adapted to light, sandy soils and will do better in shady places than Kentucky blue grass. Bent grass is also adapted to the lighter, more acid soils. Kentucky blue grass has a slightly bluish green appearance and the leaf has a boat-shaped tip. Red fescue has a bristle-like leaf and a wiry stalk, making it difficult to cut. Bent grass has taper-pointed leaves and is of two types, one strongly creeping and the other less so. Creeping bent (*Agrostis stolonifera*) and velvet bent (*Agrostis canina*) are the greatest creepers and make the best turf. They form long stolons or above-the-ground stems which make a dense mat. To prevent the stems from showing above the grass blades, it is necessary to top-dress with compost or soil. The top-dressing causes the stolons to root and stay close to the ground. These types of bent require frequent cutting, tho the velvet requires less than the creeping varieties.

The vegetative strains of creeping bent, such as Washington and Metropolitan, that have given such good results on putting greens, may

be used for lawn purposes if proper care is given them after planting; that is, top-dressing and fertilizing must be practiced, and frequent cutting, at least every two or three days, is necessary. Otherwise, the lawn will become ragged and brownish, owing to the stolons growing up above the surface.<sup>1</sup>

Of the bents that are not strongly creeping, Rhode Island bent (*Agrostis tenuis*) is the one most commonly used. It makes a very fine-textured lawn, not as velvety as the creeping varieties, but good for a home lawn. There is some indication that it may be more subject to winter injury. It is propagated by seed.

### LAWN MIXTURES AND RATE OF SEEDING

The reason for mixtures is twofold: (1) Most lawns vary in places and grass of one variety is not good in some places whereas other varieties thrive there. For example, Kentucky blue grass does well under many conditions but does not thrive where it is shady or on light, dry soil. Red fescue will endure shade and also light soils. Rhode Island bent and other bents do fairly well in the shade. These conditions make a mixture of several grasses desirable. (2) For quick results, it is often best to have a grass or clover that will cover the ground quickly and serve as a nurse crop for the permanent grasses. White clover is valuable for this purpose as is also perennial rye grass, which makes a coarse growth the first season, but is crowded out by the second year. Red top is often used in mixtures to secure a lawn in a short time. By the second or third season, if conditions are made favorable, white clover, rye grass, and red top will be crowded out by the Kentucky blue grass, fescue, or bent grasses. If the conditions are not favorable for blue grass or other good grasses, the lawn will be better because a mixture containing clover, etc., is used. By proper fertilization a bent, blue grass, or fescue lawn can be made to practically crowd out clover and the other nurse grasses.

To obtain a blue grass lawn, a mixture of 6 parts Kentucky blue grass, 2 parts red top, 1 part perennial rye grass, and 1 part white clover is advisable. Use 3 to 4 pounds for 1,000 square feet of lawn.

If a red fescue lawn is desired, substitute fescue for the blue grass in the above mixture and sow 4 to 5 pounds for 1,000 square feet of surface.

A mixture suitable for shady places is: 3 parts of Kentucky blue grass, 2 parts red top, 2 parts red fescue, and 1 part white clover. Sow at the rate of about 4 pounds for 1,000 square feet of lawn.

<sup>1</sup>For directions for constructing a bent lawn by use of stolons write to the Division of Horticulture, University Farm, St. Paul, for mimeographed circular on "Creeping Bent Grasses for Lawns."

If a bent grass lawn from seed is desired, a mixture of bent grass seed, 2 parts; red top, 4 parts; and white clover, 1 part, may be used. Sow at the rate of  $2\frac{1}{2}$  to 3 pounds for 1,000 square feet of surface. South German bent is good but expensive. Seed sold as South German bent is a mixture of about one-tenth true creeping bent and the remainder Rhode Island bent and other grasses. In the course of two years after seeding, the creeping bent in the mixture crowds out most of the other grasses. Rhode Island bent seed may be used for the bent seed in the above mixture. There are also two other bents, varieties of *Agrostis stolonifera*, from the Pacific Coast that are real creepers. One is marketed under the name Cocoos bent; the other as Astoria bent or Golfalawn. Seed of these can be obtained and they probably will make a valuable addition to our bent grasses.

### FERTILIZING WITH COMPOST

The use of compost is one of the best methods to maintain a good lawn. It is composed of soil combined with some organic material, usually manure, and left to rot in a pile for several months.

The compost pile should be made on level ground, on soil heavy enough to prevent leaching away of the liquid manure. The heap is made by piling up alternate layers of soil and manure in a ratio of about 3 or 4 parts of soil to 1 part of manure. If the soil is heavy, it is advisable to add enough sand to make it one-third or more sand; if the soil is very sandy, it is advisable to add heavy clay. To secure the correct lime requirements use acid sand in preference to the neutral. Compost should be thoroly rotted before it is used. There are several ways to hasten decomposition: (1) make the pile flat on top or preferably bowl-like to hold moisture; (2) if the manure contains much straw, add 100 pounds of ammonium sulphate per ton; and (3) keep the pile wet and at intervals chop down to admit air. Before using, chop finely and pulverize by passing through a  $\frac{1}{4}$  inch sieve.

Top-dress the lawn with compost in late October or early November, using about 1 cubic yard to 5,000 square feet of lawn. Roll and top-dress again in the spring, and in early June make another application of compost. Adding 15 pounds of ammonium sulphate to the amount of compost used to cover 5,000 square feet of lawn, promotes growth.

### FERTILIZING WITH COMMERCIAL FERTILIZERS

Unfortunately, in many localities, it is becoming increasingly difficult to obtain manure for compost. Also, the small home owner often

finds it difficult to maintain a compost pile. Consequently, the use of commercial fertilizers is increasing.

**Sulphate of ammonia** has proved to be one of the best commercial fertilizers for lawns. It furnishes only nitrogen, but as most of our soils apparently have enough phosphorous and potash for the growth of lawn grasses, it may be used alone, at least for a time. Ammonium sulphate has an acid reaction on the soil, especially if used continually for several years. As all good lawn grasses, particularly the bent grasses, grow well in acid soil and most weeds and clover do not, the continued use of ammonium sulphate will help to keep a lawn free from weeds and clover.

If sulphate of ammonia is used as a fertilizer, be sure that it is well soaked into the soil with water immediately after applying to avoid burning the grass. It may be applied during a rain. The danger of burning often makes it advisable to use some of the combined fertilizers that have part of the nitrogen in a slowly available form. The rate of application of sulphate of ammonia is 3 pounds for 1,000 square feet of lawn surface. There should be three applications a year, one in early spring, the second in June, and the third after the rains start in September. To obtain a more even application, mix it with three or four times its bulk of sand or dry soil.

**Nitrate of soda** contains about 16 per cent of nitrogen as compared to 20 per cent in sulphate of ammonia. It should be applied at the rate of 3 pounds for 1,000 square feet of lawn. It is quickly available and must be washed into the soil immediately after applying, in the same manner as indicated for sulphate of ammonia. Its reaction is alkaline and tends to encourage the growth of weeds.

**Calcium nitrate** is similar to sodium nitrate in its uses and is somewhat cheaper.

**Tankage** contains 6 per cent to 9 per cent nitrogen and 8 per cent phosphoric acid. It should be applied at the rate of 20 to 25 pounds for 1,000 square feet of lawn, depending on the analysis. The nitrogen in tankage costs more per unit than that of ammonium sulphate, and is less quickly available.

**Cottonseed meal** is a safe, complete fertilizer. It contains 7 per cent nitrogen, 3 per cent phosphoric acid, and 2 per cent potash. There is no danger of burning unless applied too heavily. Use at the rate of 15 pounds for 1,000 square feet of surface.

**Milorganite**, a sewage sludge product from Milwaukee, contains 6 per cent nitrogen and 2 per cent phosphoric acid. It is slightly acid, slow acting, and safe to apply. Apply at same rate indicated for cottonseed meal.

**Sheep manure, pulverized**, is a well-balanced, slow acting fertilizer. Apply at the rate of 25 to 35 pounds for 1,000 square feet of surface. The nitrogen in this fertilizer will cost much more per unit than that of sulphate of ammonia.

**Poultry manure, pulverized**, is similar to sheep manure, but higher in nitrogen. Use at the rate of 25 pounds for 1,000 square feet of surface. Heavier applications are likely to cause burning.

**Bonemeal** is sometimes used as a fertilizer. Its greatest recommendation is that it is safe. It is generally used in the "steamed bone" form, that has much of the fat removed. It contains about  $1\frac{1}{2}$  per cent nitrogen, 25 per cent phosphoric acid, and considerable lime. If used at all, it should be in conjunction with a quick acting nitrogenous fertilizer, such as sulphate of ammonia. Because of its lime content, it tends to destroy the acidity of the soil and thus promotes the growth of clover and weeds.

### Combined Fertilizers

Most of the experimental work with lawn fertilizers at the Minnesota Experiment Station does not indicate the need of much potash and phosphoric acid. For this reason a combined fertilizer should be high in nitrogen. A good fertilizer would be one having a formula of approximately 10-10-10, that is, 10 per cent nitrogen, 10 per cent phosphoric acid, and 10 per cent potash. This should be applied at the rate of 6 to 8 pounds for 1,000 square feet of surface, once or twice a year. A third application might well be sulphate of ammonia at the rate of 3 pounds for 1,000 square feet. Several brands of commercial fertilizer have a formula of about 4-8-4 or 5-10-4. These can be used at the rate of 15 pounds for 1,000 square feet, three times a year. Or, for one or two applications, a nitrogenous fertilizer such as ammonium sulphate or nitrate of soda may be substituted, using 3 pounds for 1,000 square feet of surface.

**Lime** is seldom needed as a fertilizer as most soils have a sufficient quantity for the best growth of grasses. On the other hand, the addition of lime is often a detriment as it decreases the soil acidity and tends to encourage the growth of weeds and white clover. Unless a soil is exceptionally acid it is unwise to apply lime.

### WEEDS AND OTHER PESTS

Weeds can be discouraged by making the soil somewhat acid and by using fertilizers high in nitrogen to promote a heavy vegetative growth of the grass. The heavy growth helps to crowd out most of the temporary weeds that appear in a new seeding and they disappear after the lawn has been mowed a few times. A few weeds, especially



dandelions, plantain, yarrow, and crab grass, often persist as troublesome pests. Pulling the weeds by hand will help to control them. Crab grass, especially, should be kept pulled to prevent spreading and forming a dense mat that will smother the permanent grasses. Where it has become very thick, use an iron-toothed rake to pull up the creeping branches, so the mower will cut them. Then rake and cut in the opposite direction. What is left pull out by hand. Above all, fertilize the grass well with sulphate of ammonia to help crowd out this pest. Tap-rooted weeds like dandelion may be cut off low down with a long-bladed knife if they are not very plentiful. They may be destroyed by applying sulphuric acid to the crown. The bottle of acid should be placed in a wooden box. Dip an ice pick into the bottle and jab it into the crown of the dandelion, thereby killing the dandelion without injuring the grass. Be careful not to spill acid on the grass, hands, or clothing, as it will burn anything it touches.

**Dandelions** and other broad leaved weeds can be greatly reduced in numbers by spraying with iron sulphate solution. Dissolve  $1\frac{1}{2}$  pounds of iron sulphate in 1 gallon of water and apply with a sprayer that makes a fine mist spray. Three gallons will cover about 1,000 square feet of lawn. This treatment is more effective if applied just when the dandelions are budding. A second application about ten days later will be valuable. Following the spraying, the lawn will have a blackened appearance for several days, but if properly applied, the grass itself will not be injured greatly and will soon recover. Wash out the sprayer very thoroly as the iron sulphate solution has a corrosive action on metals.

**Earth worms** can be controlled by mercuric chloride, 2 ounces to 50 gallons of water on 1,000 square feet of space, or lead arsenate, 5 pounds mixed with 25 pounds dry carrier or soil, sand, or organic fertilizer. Spread with fertilizer distributor. Earth worms are not often troublesome, but occasionally become a pest.

**Grubs**, larvae of various beetles, especially the May beetle or June bug, can be controlled by the lead arsenate treatment as described under "earth worms."

**Ants** often cause great damage to a lawn and are difficult to destroy. There are some commercial ant poisons and repellants that are effective. Where large ant hills are present they can be destroyed by carbon bisulfide. Holes, ten inches apart and six inches or more deep, should be punched in the hill and immediately surrounding it. Put one or two tablespoonfuls of carbon bisulfide in each hole and close, using damp soil. Small colonies of ants can be eradicated by putting a few drops of carbon bisulfide into each hole. An oil can may be used for

this purpose. Extreme caution must be taken that there is no fire or lighted cigar near where this liquid is used as it is more explosive than gasoline. It is likely to cause some injury to the grass and for that reason some poison is often preferable, such as the following: sodium fluoride 75 parts, fresh buhach powder 15 parts, and granulated sugar 10 parts. Mix the ingredients and sprinkle freely around the flower beds or ground where the ants are plentiful, when the ground is dry.

Another formula that depends upon a rather strong poison for its effectiveness is the following: sugar 1 pound, arsenate of soda 125 grams, water 1 quart, honey 1 tablespoonful. Dissolve the sugar in the water, then add the sodium arsenate. Boil the mixture until the arsenate is dissolved, then add the honey. Soak bits of sponge in this mixture and place on shallow dishes where the ants will carry them into the hole. In this way, the whole colony, including the queen, may be poisoned. This mixture is poisonous and should be placed so that children, animals, and birds cannot reach it.

## DISEASES

There are two kinds of diseases that are likely to cause trouble: brown patch and snow mold.

### Brown Patch

There are two types of the brown patch disease. One is called large brown patch, the infected area being from 4 inches to 18 inches in diameter; the other form is called small brown patch, in which the infected areas are the size of a silver dollar or smaller. This disease kills the foliage, turning it brown in patches, but does not kill the roots. It affects creeping bent, red top and fescue grasses, but not Kentucky blue grass. One of the various mercury compounds, such as Semesan, calomel or corrosive sublimate, may be used to control it. Semesan at the rate of 1 pound per 1,000 square feet of lawn has proved effective for both forms and does not burn the lawn. Corrosive sublimate, mercuric chloride, also controls both forms of the disease at the rate of 3 ounces per 1,000 square feet. On a small scale it should be mixed with moist soil or some form of organic fertilizer and allowed to stand over night before applying. It is a deadly poison and care must be taken in its use. On a larger scale it may be applied with a fine spray, dissolving 1 ounce in 50 gallons of water. This amount should be applied to 1,000 square feet of lawn. A solution of  $\frac{1}{2}$  ounce to 50 gallons of water is often effective. Unless carefully applied it is likely to cause burning. During the hot part of the summer it may be advisable to make frequent applications at intervals of 7 to 10 days.

Calomel is most effective against the small brown patch. It is not so likely to cause burning. The rate of application is the same as that for mercuric chloride when mixed with soil and should be applied in the same manner.

### Snow Mold

In the northern states where a heavy blanket of snow occurs, this disease is often destructive. The grass is destroyed in patches by a fungus which rots the blades and often the roots. It is worse when snow covers the ground before freezing. Mercuric chloride used at the rate of 3 ounces per 1,000 square feet of lawn, applied just before the ground freezes, will control it. Apply either mixed with soil or other filler, or in a liquid spray.

### REJUVENATING AN OLD LAWN

When a lawn becomes poor and thin, either in spots or over its entire surface, it is often necessary to give it special treatment. In some instances, especially when the grass has been crowded out by tap-rooted weeds, the best plan is to spade up the lawn, add manure or other fertilizer, and then seed it. It is often possible, however, to renew an old lawn by fertilizing and reseeding or often by application of fertilizer alone. First make an application of sulphate of ammonia or a complete fertilizer. Then if the surface is irregular and full of pockets, apply a coating of soil or compost and rake over to fill all depressions; next sow a good lawn grass mixture and rake the seed into the soil. When the grass has a good start, make regular application of commercial fertilizer. On lawns where the grass has been starved because of impoverished soil, often indicated by a heavy growth of moss, the use of sulphate of ammonia or a complete fertilizer will often bring it back to a healthy condition in one season. If the soil is very poor, a longer time is required to restore a good lawn surface. Continued application of compost and fertilizer, or commercial fertilizer alone, will eventually build up a fine, even turf that will compare favorably with a lawn one or two years old.