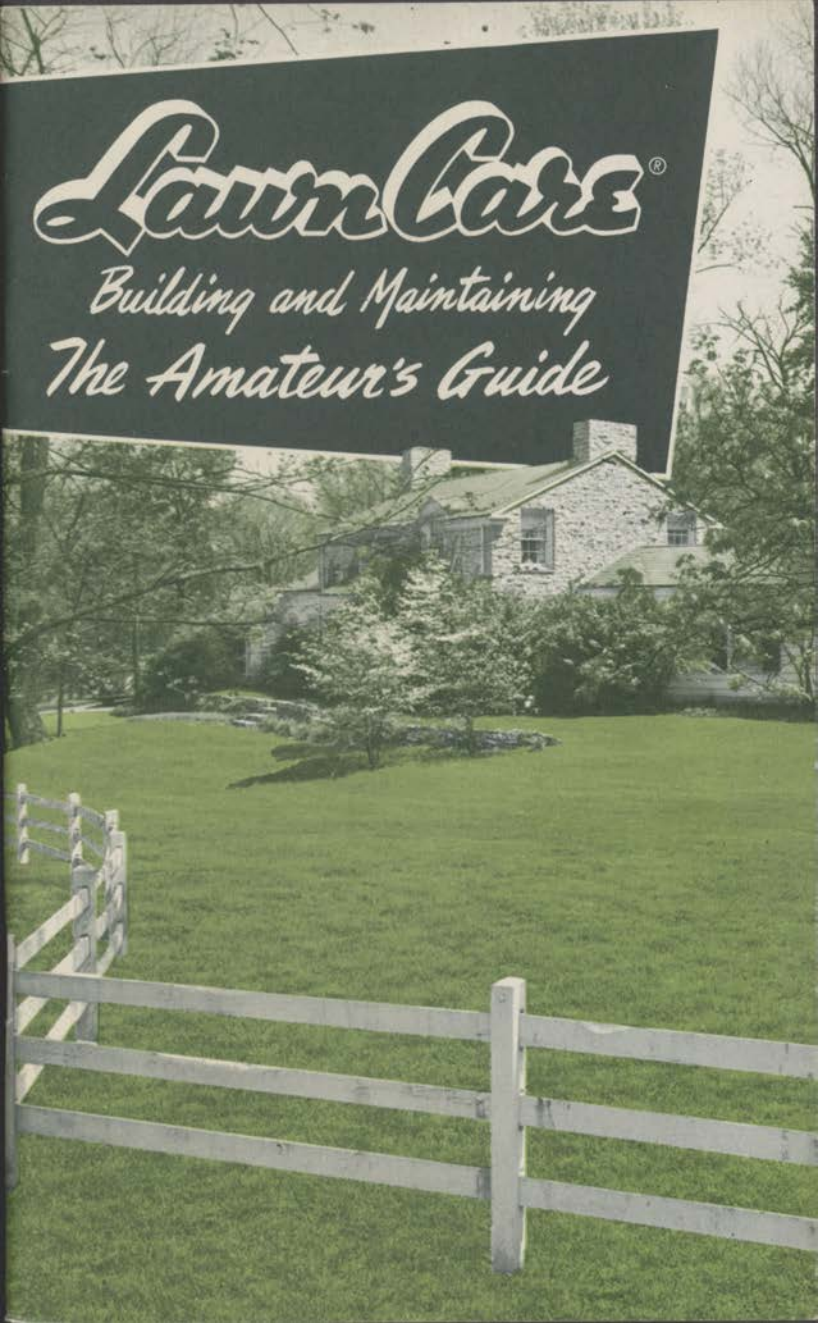
LawnCare®

Building and Maintaining

The Amateur's Guide



LAWN CARE

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Planning The New Lawn

PRELIMINARY STUDY is just as helpful to good lawn building as it is to home building. A better lawn is possible at less cost if early consideration is given to saving of topsoil, utilizing the natural grade to best advantage and making plans so the actual seeding will be done at the best time of year.

Many new lawns turn out disappointingly because they were planted at the wrong season. In most localities the one best time is late summer or early fall when shorter days and cooler evenings are in the offing. Germination and seedling growth are better when the soil is warm but the days not quite so hot and moisture more abundant. The fall planting season may get under way in August, extend through September or later if weather conditions permit working the soil.

A good lawn can be produced in the spring but it takes more attention than one sown in autumn. With good soil, proper watering and mowing, lawns may be started in the summer with reasonable success. Generally speaking, after trees are leafed-out, it's better to plant a temporary grass or clover cover, making the permanent seeding in late summer.

In the mid or deep South, warm season grasses such as Bermuda or Zoysia are best seeded in late spring or early summer.

It is well to budget the cost of a lawn as part of the cost of the home. The main expense will be in grading and soil preparation. If topsoil must be brought in, this may cost from three to five dollars per cubic yard. Unless a substantial fill is needed, it may be better to utilize the soil on the property in preference to a big outlay for imported topsoil.

No matter how rich the soil, it is important to apply a good grass food just before seeding. The cost of good seed and fertilizer is not apt to run more than five dollars per 1000 square feet (50 by 20 ft), a small part of the total lawn cost.

It is of prime importance that the highest quality seed be used. It costs more per pound but generally less per lawn because fewer pounds are needed. It is unwise to risk the total lawn investment by use of inferior materials.

The Lawn Grade

The lawn is usually the dominant feature in the landscape picture. It sets off the house and enhances other landscape plantings. Walks, shrubs, flower beds and statuary are better placed at the perimeter of the lawn since clear areas create an illusion of spaciousness.

The direction of slope should be given consideration in the lawn plan. In general a northern or eastern exposure is more desirable. The southern and western slopes are subject to more intensive rays from the sun and so suffer more from heat and drought.

In grading, it is desirable to maintain natural and gradual contours. Avoid severe grades wherever possible. They are difficult to establish and maintain because of erosion by heavy rains and extreme drying in periods of drought. Abrupt changes in grade cause mowing difficulty.

Soil Problems

Probably the most important single feature in building the lawn is the soil. Good loamy topsoil is valuable and makes the best lawn or garden or farm. (See Chapter 2).

Before the basement is dug or there is any filling or grading of the property, topsoil should be saved by scraping it to one side for later replacement.

In case a substantial fill is necessary, this may be made in part with subsoil but the upper 4 to 6 inches should be good topsoil if possible. The fill dirt should be free of large stones. It is better if it is somewhat sandy or gritty as this will provide better underground drainage and will not compact as readily as pure clay. Many poor spots in otherwise good lawns are due to the effect of buried building debris.

If the heavy rains drain slowly due to impervious clay or hardpan, installation of tile drainage should receive serious consideration. Growing conditions will be better for the lawn, shrubs, trees and the garden if surplus water is removed. Basement leakage will be less of a problem if the ground is well drained.

Scotts Lawn Research of Marysville, Ohio will analyze soils and make recommendations regarding them at nominal cost. It is advisable to learn in advance the general classification of a soil, how it should be handled and whether it needs lime in addition to fertilizer.

Plans For Watering

There are advantages to automatic irrigation systems with pipes concealed underground. If such a system is to be installed, plans should be made in advance so this work can be scheduled in proper sequence. Even if an elaborate system is not included, it is a good idea to give thought to the location of convenient spigots to attach hose, possibly a type of underground connection in the middle of the lawn.

Tools For The Job

If the owner decides to build the lawn himself, he may find it advisable to hire some of the heavier work done. For example, large grading jobs are quickly handled by bulldozers or tractors equipped with blades. A rototiller or similar cultivator may accomplish in an hour the amount of soil preparation that would otherwise require days of hand labor. Such machines and operators for them may be hired by the hour in many localities.

Garden tractors with plows, disc and spike harrow will help in readying lawn soils. This equipment or the tillers

Garden tractors with plow and disc attachment are useful in lawn soil preparation.

will also aid in the incorporation of organic matter. Small hand equipment required includes spades and shovels, a heavy hoe and two types of iron rakes. The usual garden rake is all right for the lighter work but a heavier road-grading style will save time in cultivation and leveling.

A water ballast roller is helpful in lawn building as is a seed and fertilizer spreader. These machines may be rented from local hardware or seed stores, although it is better to invest in a spreader because of its importance in lawn maintenance. The spreader should be of a type that is accurate for seed sowing as well as grass food applications.

Adaptable Grasses

Fortunately the most desirable lawn grasses will thrive over a major portion of the Northern Hemisphere. There are excellent lawns in Alaska and Canada of the same lawn seed used so successfully over most of the U S from Maine to Washington, California to Georgia and even in higher elevations of Mexico.

The most attractive grasses withstand extreme cold better than protracted periods of unrelenting heat. Thus daytime temperatures over 100 may be tolerated by grasses if the nights are cool so the soil temperature does not get too high.

In the commercial cotton zone of the South, rank growing subtropical grasses crowd out all other grasses in hot weather, except in the shade. Since these grasses turn brown when the weather gets cooler, it is necessary to sow seed in the fall if a green lawn is desired over the winter months.

Choosing the lawn goal in advance is a good idea. Generally speaking, lawns fall into three categories:

1. The *deluxe* lawn or picture lawn — requiring moderately good soil, careful preparation and maintenance including regular watering during dry weather.
2. A *good lawn*, the one for casual living not requiring the finesse of care given the deluxe lawn.
3. The *utility lawn* developed where the soil is not so good, rough usage is expected, minimum care is desired.

Most lawns can be improved by proper care so it is not necessary to be forever satisfield with a second rate lawn.

The matter of seed selection for these different classes of lawns, is discussed in another chapter. Differences in the maintenance program are pointed up in various sections of this book.

Soil for the New Lawn

SOIL PROVIDES the lodging place for grass. If it is good quality garden loam, the problems of starting and maintaining the lawn will be easier. On the other hand, most lawns and many excellent ones are growing in stiff clay subsoils or light sandy soils almost devoid of organic matter. Their owners have exerted the extra care in management, feeding, watering and mowing that enables them to enjoy lawn success in spite of poor soil.

Good soil is precious and one blessed with it should husband it with care. One of the commonest mistakes in home building is the practice of covering good topsoil with excavation dirt and building debris. Thus in a few hours centuries of nature's accumulation of topsoil may be lost.

Origin of Soils

Soil is formed by the breakdown of rocks and varies according to the type of native rock, climate, slope, age, organisms and organic additions. The presence of decaying organic matter, known as humus, is the main reason weathered topsoil supports plant growth better than does exposed subsoil. Better soils are generally darker, due in part to the fact that organic matter tends to become dark brown or black as it decomposes.

The humus-rich, surface layer of topsoil is seldom more than a few inches in depth except in valleys or alluvial plains where good soil from the uplands has been deposited by wind or water. Poorer soils are generally either sands or gravels, or the plastic, light colored clays.

The physical condition determines a soil's value — that is, the texture or size of the soil particles, their structure or arrangement and the content of organic matter. The richness or fertility of any soil is not of primary importance. It is easy to add the necessary plant food to soils to make them rich and

to add lime to overcome acidity. Even after the lawn is planted, these can be applied at the surface, but it is difficult to overcome poor physical condition.

The average person has little choice as to native soil for his lawn but he can protect good topsoil by arranging to have it moved aside before building operations are started.

Soil Types

Soils are classified as clays, loams and sands depending upon the size and proportion of the individual particles. There are, of course, mixtures of all three and various gradations from one to the other.

Unmodified clay is composed of extremely fine particles which tend to form a sticky, compact mass when wet. Heavy clays retain a large amount of water which is released slowly in dry seasons. When they do dry, they tend to bake as hard as brick. In fact pottery, tile and brick are made by puddling and heating certain types of clay.

Clay usually dries to a light color. It shrinks in drying, causing cracks and crevices through which the deeper-lying moisture escapes.

The extreme contrast to heavy clay is sand. The individual particles of sand are much larger than those of clay though the casual observer may think the opposite is true. Often clay looks coarser because minute particles stick together forming grains or small lumps. Since sandy soil is loose and frequently low in organic matter, it drains quickly and dries rapidly. Sandy or gravelly soils do not retain sufficient moisture for good grass growth in the summer months. They must be watered almost daily and even then the grass may suffer during periods of extreme heat.

The Ideal Soil

The better lawn soils are the loams made up of silt and clay with organic matter and sand to provide control or drainage of surplus waters.

Those who have clay or sandy loams are indeed fortunate. Their soils are friable soon after heavy rains, yet have sufficient organic matter to carry moisture reserves for dry periods. Such soils are generally fairly dark color even when dry.

Since humus imparts this dark color to soils, many have the idea that all dark soils are good. Not so, some of the

blackest soils are simply muck such as found in drained swamp lands. These become powdery when dry and do not have the body necessary to support grass growth.

Many soils that are light brown or red when dry have the appearance of a dark, rich soil when wet. It is not a good idea to judge a soil by its color when it is wet.

The physical nature of a soil can be determined by a simple experiment. Moisten a sample of the soil and roll it into a ball, exerting as little pressure as possible. Allow it to dry under normal room conditions. Then drop the ball to a hard surface from a height of three feet. If it crumbles readily it can be considered of good consistency. If it remains intact there is probably excessive clay. If it crumbles in the hand there is likely too much sand.

Improving Soil Conditions

Two procedures may provide better lawn soils. One is to incorporate liberal amounts of soil of opposite texture together with organic matter. The other is to import the equivalent of four to six inches of good loamy topsoil. When this is added, a gradual blending of subsoil into topsoil is advised, by putting down an inch or two of topsoil and mixing it into the soil in place.

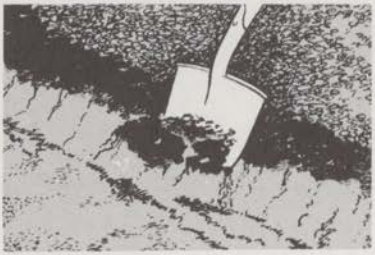
Heavy Clays. The first rule in dealing with the heavier soils is to avoid working them when wet. In such condition cultivation or heavy rolling causes serious compaction. Incorporation of sharp, coarse sand helps to make clay more friable. Fine molders sand will not do as it will have the opposite effect. Pulverized slag, charcoal, sifted ashes and similar materials may be used in place of sand. Large volumes of decaying organic matter help make soils more friable.

To effect any appreciable change in heavy clay, it is necessary to incorporate 25% to 50% by bulk of the coarser textured material. That means a minimum of one inch of sand to three inches of clay. Chemical soil conditioners may help some soils but the expense is considerable and the lasting qualities uncertain.

Sandy Soils. The coarser grained sandy soils are made more suitable by mixing in clay. Only a small portion is required because the fine grained clay has a greater modifying effect than sand. Possibly 15% to 20% by bulk may be enough, or

at the ratio of one-half inch of clay to three inches of sand. Generous quantities of organic matter are also helpful.

Blow or beach sand will not support a lawn unless covered with 5 or 6 inches of good topsoil.



Whenever materials are being added to improve soil, they should not be left as layers, but intimately mixed. If topsoil is introduced, an inch or two should be spread over the existing soil and then spaded, tiled or raked in so as to effect a gradual change from subsoil to topsoil. After that the balance of the topsoil may be put in place.

If time permits, it is well to complete the soil modification program a full growing season ahead of the lawn planting. Some of the weeds will sprout and they can be eliminated by cultivation. Another advantage is that the soil will settle and it is better if this occurs before seeding. *A six inch depth of loose soil will settle at least an inch or two.*

In calculating the amount of topsoil needed, it should be borne in mind that 16 cubic yards will make a loose fill to a depth of four or five inches over 1000 square feet (50 ft by 20 ft). This will settle to three or four inches.

The New Lawn
Rough Grading and Drainage

ROUGH GRADING IS USUALLY the first step in actual lawn construction. The extent of grading required will depend upon the condition of the ground, the cut and fill required to attain the desired final levels, and the attention that must be given the problem of severe slopes.

It is well to utilize the natural contours of an area. Extensive grading is costly and may result in an artificial looking landscape scheme.

Any lawn should have some degree of slope to insure run-off of excess water. The landscape men recommend a pitch of at least 6 inches in 100 feet. A change in grade is better if it is gentle. The maximum feasible grade considering mowing, watering and maintenance is 1 foot in 10 feet. Abrupt changes are best handled with terracing.

The final grade of the lawn will be fixed by certain established features such as the house foundation, the sidewalk, street or road, or even the presence of valuable trees. As detailed elsewhere, it is important to protect the grade above the tree root zone.

It is to be assumed that valuable topsoil will be stripped and piled to the side, out of the way, before any extensive grading operations are undertaken.

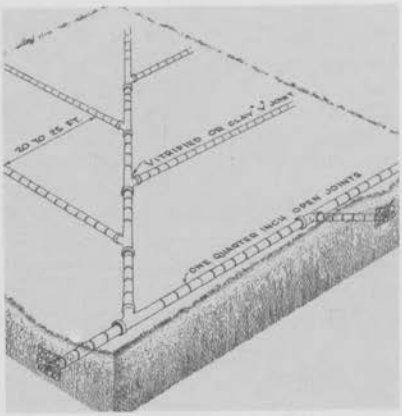
The actual grading should be in two parts. First, the subsoil grade. It is desirable to have it of the same contour as

the final grade, except that it should be lower to make allowance for the addition of topsoil. Uneven topsoil depth will cause variation in lawn quality.

While subsoil grading may not always be necessary, it is particularly important if the subsoil is impervious clay which will trap excess water during heavy rains or spring thaws. Such subsoil needs to be graded so the underground water can drain by gravity. Otherwise tile drainage should be installed or the saturated subsoil will prevent deep-rooting.

Underground Installations. Tile drainage lines are best installed during or just after sub-surface grading. If the topsoil from the property has not been moved aside, care should be exercised to prevent the loss of topsoil over the trenches either in digging them or in making the backfill.

ALMOST ANY LAWN that will be growing in a heavy soil or where it may receive seepage water from higher surrounding ground, will be benefited by a properly installed tile drainage system.



An effective lawn drainage plan. Laterals may be closer or farther apart as necessary.

The first requirement is to find a suitable outlet of sufficient depth into which the tile can empty.

The minimum effective fall of drainage lines is 3 inches in 100 feet. It is better to set the grade with a leveling device. The tile should be 18 to 24 inches deep and the lines generally not over 20 to 25 feet apart.

A typical drainage layout is shown in the illustration. The herringbone pattern is more or less standard with a main line of 6 or 8 inch tile into which 4 inch laterals are connected. It is better if they enter at an angle with the flow of the water. Clay or cement tile is satisfactory. They should be placed with ¼ inch openings as that is where the water enters and not through the walls of the tile.

It is desirable to cover tile lines with 6 inches of cinders, gravel or crushed stone before the trenches are back-filled with dirt. This makes them more efficient and lessens the chance of the tile filling with silt and mud.

Control of Grading

Before a cut is made or a low spot is filled, some levels or points of elevation need be established. On large areas engineering help is needed to set grade stakes, particularly if the distances are over 75 feet. The amateur can set stakes for lesser distances by using a string or line level. These are inexpensive levels, encased in metal hooks on either end for temporary fastening onto the cord. By stretching a cord and using the line level, any number of stakes can be placed at the same level. Each stake can be marked with a pencil as to the amount of cut or fill required. The closer the stakes, the more exact the final grade.

Small lawns are usually brought to grade by good work with shovel and wheelbarrow to move the high spots into the low ones.

Larger lawns may call for the use of a tractor and plow, a scraper and leveling drag or even a "blade" powered by a jeep, small tractor or bulldozer. Sometimes other types of road grading equipment are available. Reference stakes for such extensive operations should be established at frequent intervals so that too much time will not be lost in determining intermediate grade positions.

Whatever the size of the lawn, the method of setting the stakes or the equipment used, the goal should be subsoil and surface grades of sufficient slope to drain surplus water so it does not collect in holes or pockets.

The final covering should be good topsoil, if possible, to an even depth of 4 to 6 inches or more.

Replacing The Topsoil

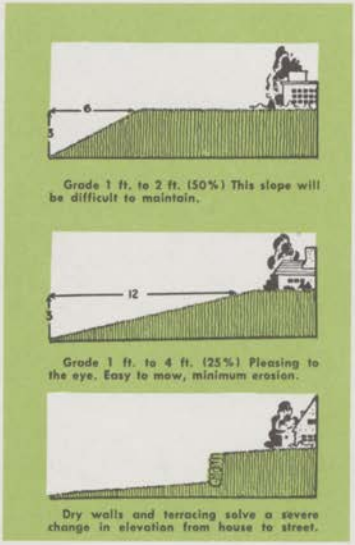
If extensive grading operations are carried out in wet weather, the subsoil may be severely compacted before the job is done. If that happens, the hardened soil should be roughened by cultivation to a depth of 2 or 3 inches so there will be a mixing of topsoil and subsoil and not a definite layering.

The latter will interfere with normal movement of air and water through the soil and restrict normal healthy root development.

If the grading plan or the soil condition requires additional topsoil, the depth should be allowed for in the grading operation. It must be borne in mind that loose soil settles considerably. A layer of 6 inches will shrink at least one inch and maybe two. Twelve cubic feet will cover 100 square feet to a depth of 4 inches, but this will settle to a depth of 3 inches or less.

Grading Slopes and Terraces

It is difficult to maintain grass where grades are sharper than 25%, that is a drop of more than one foot in 4 feet. Grass can be held on slopes up to 50% but that is quite a severe problem. As grades approach or exceed one foot drop in two feet horizontal distance, it is better to resort to ground covers or ease the grade problem by means of retaining walls and terracing.



Grade 1 ft. to 2 ft. (50%) This slope will be difficult to maintain.

Grade 1 ft. to 4 ft. (25%) Pleasing to the eye. Easy to mow, minimum erosion.

Dry walls and terracing solve a severe change in elevation from house to street.

The poorest soil is often found on slopes because of erosion or carelessness in grading. Because slopes usually make grass growing more difficult, it is well to have as great depth of good soil as possible.

Protecting Trees

Those blessed with large trees will want to protect them during grading operations. An experienced tree man should be consulted if the new grade is to be decidedly lower or higher than the natural grade under the trees. If the grade is to be lower, a sloping mound of soil should be left around the base of the tree, extending out as far as the drip of the branches. As much soil should remain over the root zone as was there originally.

If, to the contrary, the level is to be higher, some arrangement of a dry well or a fill of gravel and stone is required under the tree so the roots continue to get needed air.

Finish Grade and Seeding

PRELIMINARIES in lawn building include rough grading, installation of tile drainage and underground utilities. Next in order is grading of the surface to the levels desired for the finished lawn and, finally, seedbed preparation.

It is to be hoped that at least four or even six inches of good friable loam topsoil is in place. If parts of the lawn were not disturbed in grading, they should be cultivated. Extensive areas may be plowed or better still, loosened with a disc set to cut three or four inches in depth. That is sufficient if the natural grade is acceptable for the final lawn.

Loam or clay soils must not be worked when wet and sticky, because they will tend to clod and dry into hard compact masses. Extensive working of most soils is better accomplished in summer when they are apt to be drier.

Smaller areas may be prepared with power rototillers, garden tractors or by hand spading. In any method, care should be taken to avoid turning up subsoil and burying good topsoil.

Soil Improvement

This is the last chance to incorporate soil improving materials such as organic matter or sand. The physical condition of the soil cannot be much improved after seeding so whatever is necessary should be accomplished now.

After plowing or spading, the soil is apt to be rough and cloddy. Discs or power cultivators are useful in breaking up such soil as are garden cultivators, heavy hoes and rakes.

Except on large open areas, the final soil preparation and leveling is best done by hand. On acreage seedings, this may be accomplished with drags, spike harrows, cultipackers and the like.

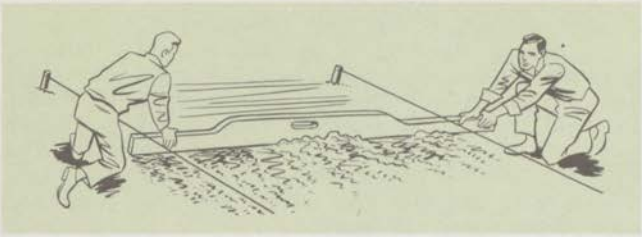
Before the final working, it is well to incorporate lime if a soil test has shown this to be needed. The raw ground agricultural limestone is usually recommended and generally

applications will vary from 50 to 100 pounds per 1000 square feet or one to two tons per acre.

Final Leveling

In final grading care is needed to see that surface drainage is provided to all parts of the lawn. Depressions where water will stand, high spots that will be scalped in mowing, or sharp changes in grade should be avoided. One way to guard against this possibility in flat lawns of limited area is to use a leveling board in the final stage of seedbed preparation.

A 12-foot plank makes a good leveling board if one like that shown in the illustration is not available. When used, strings are stretched with the "fall" of the land, 12 feet apart.



The strings are held on stakes and located on the stakes the width of the board above the desired finished grade. Thus when the board is held edgewise between two lengths of string, it is possible to ascertain the high and low spots and adjust them accordingly.

Seedbed Preparation. Alternate harrowing or hand raking and rolling serve to break the surface soil. Some clods will be raked out in the operation and these may be used to fill in low places after removal of stones and rubbish.

With heavier soils, the finished surface need not be as fine as can be developed in a sandy loam. If there is a good dispersion of pea-size particles in a clay or clay-loam seedbed, it is just as well to have a mixture of larger pieces, up to a half inch or inch in diameter — between the size of a marble and a golf ball.

A deep dust mulch is not good because of the possibility of the formation of surface crusting because of the puddling

action of heavy rains or waterings. It is difficult for seedling grass to emerge through such a crust. A moderately coarse surface will not appear as attractive but will have crevices into which seeds can lodge and find moisture for germination. Seedlings will be sheltered from washing rains and drying action of the sun.

Apply Grass Food

It is essential that a generous supply of soil nutrients be available to the sprouting grass. Since it is more readily available if fairly near the surface, the application of grass food is recommended in connection with the final raking.

Grass food can be broadcast by hand, but a more even distribution is obtained with a SCOTTS SPREADER.

If footprints or wheeltracks are much in evidence, they should be raked out before seeding.

Grub Proofing. In the Atlantic seaboard states, grubs of Jap Beetles ruin many lawns each year. They are extending their operations westward all the time and along with white grubs of May beetles and June bugs are now serious pests around Pittsburgh, Cleveland, Detroit, Cincinnati and St. Louis.

Where there is likelihood of grub infestation, it is a good idea to treat the soil before seeding with a pest control that will destroy grubs hatching from eggs in the soil.

Selecting the Seed

Too often lawn seed is purchased because of low cost per pound. Often such seed is the most expensive per lawn because coarse, large seeds fill up the package. They may not have the ability to produce a lawn but in any event they have to be planted heavily. It may well be necessary to use three pounds of ordinary seed to get as many grass plants as can be obtained from one pound of the best lawn seed.

Selection of a "Shady Lawn" mixture or a "Terrace" mixture is not the answer to either problem. The problems are solved by the right maintenance program as stipulated in later chapters.

The important consideration in seed selection is to consider plans for maintenance. Will the lawn be regularly watered in dry seasons, cut short, fed frequently and SCUTL-ed for disease.

Then get seed for the deluxe lawn. If, in contrast, the growing conditions will be very poor, the use of coarser, hardier grasses may be the answer. A good plan is to select the seed firm in which one has confidence, then choose from the brands of that seedsman according to needs.

When to Seed

With few exceptions, the best seeding time is right after the months of hottest weather, when the days grow noticeably shorter and better conditions of moisture are expected. Usually heavier dews are typical of the fall season, and in many localities rainfall is favorable. Evaporation is less rapid than in mid-summer and irrigation less of a problem.

Preparing the soil in summer or in dry periods may develop a powdery condition in the upper inch or so of surface soil. If that happens, it is better to wait for rain to settle this dust mulch or water thoroughly before seeding. Otherwise the first heavy rain may bury the seed so deeply that it cannot germinate or may wash the seed out of place.

It is all right to go ahead with seeding as long as the soil is workable even into November or December. The seed may not germinate until the following spring, but it will not be harmed appreciably, whether sub-zero temperatures are common or not.

Spring seedings should be completed as early as weather permits to get root growth before hot weather. Heat is just as much an enemy of seedling grass as drought. The actual date of spring seeding depends upon when the ground gets dry enough to work. This may be February or possibly not until May.

Summer seedings can be successful only if adequate irrigation is possible. Normal rainfall may sprout the seed but it would be unusual for nature to provide steady rains to support the seedling grass to maturity.

How to Seed

Whether seeding by hand or spreader, it is well to divide the seed, sowing part in one direction, the balance crosswise to the first. This assures more even coverage and lessens the possibility of missed spots or windrows.

Covering the Seed. There is no one best procedure for covering seed. The question whether raking or brushing is better than allowing nature to bury the seed by action

of rain and alternate wetting and drying is debatable.

Seed is sometimes covered by a light hand raking or by dragging a flexible steel door mat over the area. Rolling follows to firm it into the soil. A good practice is to rake after the first part of the seed is sown, rolling only after the second. A light roller is advised, just heavy enough to firm the soil, not pack it.

Small lawns may be topdressed with an eighth-inch or so of screened soil or compost. The use of raw peat moss is a questionable practice since there is danger of the roots growing up into the peat instead of down into the soil.

Protecting the Planting

Nothing can or need be done to protect grass seeds or seedling grass except to preserve moisture and prevent washing during heavy rains. Many like to "mulch" after a late spring seeding. Clean straw may be used to conserve moisture (they reduce evaporation) and to prevent serious washing. Not more than an inch or two should be used and this ought to be raked off as soon as the grass is well started. Interlaced cord, held down by pegs, is often used to hold the straw in place.

Coarse cheese cloth or even light weight open burlaps may be used to hold seed in place and conserve moisture. They should be removed as the grass gets a good start. Open mesh material such as used for handling oranges and onions makes a good covering to reduce erosion. This material (Erosionet) can be purchased by the yard. Anchoring any such material is a problem. Small wooden pegs or even golf tees are safer than wire or spikes, considering the lawn mower.

Early Care

While prolonged drouth does not harm seed, its germination can be hastened by regular watering to take advantage of otherwise good growing weather. Once the seed has started to sprout, the supply of moisture must be constant or the plants may perish. Two or three waterings with a fine spray may be required on bright days until the grass gets a good start. It is not necessary to flood the ground but the surface needs to be moist at all times. As the grass matures, watering can be less frequent but heavier.

Young turf is not benefited, may even be harmed by any covering designed to protect it from cold. New grass should be cut when any of it gets close to two inches tall and with a very sharp mower set at 1 to 1½ inches. Dull blades pull out plants and break many of the tender hair-like roots. Traffic should be kept off new grass, at least until after several mowings.

Proper Mowing

THE PRINCIPAL PURPOSE of mowing a lawn is to improve its appearance. Unless properly done, however, this improvement will be temporary, for one thing is certain — how a lawn is mowed has much to do with its health.

The important factors in mowing are:

1) *Start clipping as soon as there is any appreciable growth to be cut.*
2) *Decide upon maximum and minimum heights of cut for hot and cool seasons.*
3) *Try to mow the lawn before it has grown much more than a fourth of the cutting height. Frequent mowing is desirable.*

Looking to the health and appearance of the lawn, the one most important point is to mow so that only moderate growth is cut back each time. Through the centuries nature has endowed grass with the ability to tolerate frequent defoliation but the roots will suffer if too much of the energy producing green growth is suddenly removed. Grass looks bad if tall growth is cut back because the lower leaves will be brown and scraggly due to the shading effect of tall grass.

The Right Height

The reader is referred to the discussion in Chapter 1 regarding his choice of lawn goal. The three categories of lawns are not rigid castes but it is well to determine what is desired and establish mowing plans accordingly.

Mowing heights may be determined on this basis:

	Cool Season	Hot Season
Deluxe — short cut	1 inch	1 1/4 inches
Good — medium cut	1 1/2 "	2 "
Utility — high cut	2 "	2 1/2 to 3 "

In dense shade grass has to live on reduced ration of sunlight. Such lawns are better maintained at the medium

or high cut levels except when tree leaves are dropping in the fall.

Disposition of Clippings

This is largely a matter of appearance. If the clippings are evenly scattered and not heavy, it makes little difference in grass health whether they are removed or not. Clippings will be detrimental if matted so as to smother the grass. They may give the lawn a dull, brownish cast.

Clippings are of negligible value in returning plant food to the soil. They have slight value as mulch in reducing evaporation. This is a questionable blessing since a layer of decaying vegetation at the soil surface contributes to the activity of harmful fungi and molds that may cause grass diseases in wet conditions. Clippings may also harbor harmful insects.

Some utilize grass cuttings to advantage as mulch about shrubbery, in gardens or as humus-forming additions to the compost bed.

Actually the disposition of clippings can be a matter of an individual's choice as to whether he uses the catcher on his mower, rakes or sweeps the clippings, or simply lets them work down into the turf. If the unsightliness of the clippings can be tolerated for a day after cutting, there will be less bulk to rake up and carry off.

Lawn Sweepers are excellent for gathering clippings and help give the lawn a better groomed appearance.

Type of Mowers

It is a matter of individual determination whether the lawn is cut by hand or with power, with the traditional reel type mower or the newer rotary types. The important considerations are:

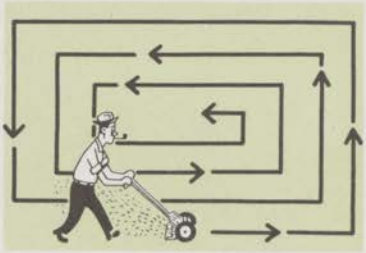
1) *Select a good machine, one that has the range of cutting heights needed.*
2) *Keep it sharp and in good adjustment. Many lawns have a brownish cast after mowing due to tearing or bruising of the grass blades in mowing.*
3) *Rotary mowers have certain shortcomings but outstanding lawns can be maintained if relatively free from undulations, surface depressions or high spots.*

Other considerations regarding mowing equipment include weight, ease of manipulation, ability to trim close to trees and shrub beds, danger to users and others. There may

be some advantage in the suction action of rotary mowers in pulling grass to an upright position in the cutting.

Pattern of Cut

If convenient, it is well to alter the direction and pattern of lawn mowing from time to time. One problem is that one of the mower wheels is traveling on uncut grass. This flattens a track of grass especially during lush spring growth. If a reel-type mower is operated back and forth, the action of the cutting reel tends to push the track of depressed grass down further and miss cutting it. This usually results in a ridge of uncut grass, unless the lawn is mowed a second time.



One way to help overcome this is to mow around the plot as shown by the diagram. In round and round mowing, if the rotation is such that the clippings are thrown into the uncut grass, they will be chopped and scattered a second time.

Special Mowing Problems

Steep Terraces should be mown up and down with the slope. To cut crosswise of the ridge or crown will cause scalping. If the slope is definitely south or west, it may be better to avoid short cutting because of the stronger bearing of the sun on such exposures. A taller growth of grass insulates the soil and roots to some extent and helps reduce soil erosion.

Seeding Spikes. It is normal for grasses to shoot up flowering seed stalks in late spring or early summer. This characteristic may even appear in regularly mown lawns in some seasons. Scattered seed stems may hug the ground and get quite coarse. This is more pronounced in some types of grass than others but may develop in any lawn, especially one having bare or thin spots.

The period of this seeding is usually limited to a couple of weeks. Extra patience in mowing, possibly raking up the prostrate stems, use of grass shears, sickle or grass whip may be called for. Another solution is to cut the scattered seeding stems with a sharp spade or ice hoe before or after mowing.

Watering Lawns

THE BRILLIANT GREEN LAWNS of the British Isles owe their beauty not to any closely guarded secrets, but mainly to ideal moisture conditions. Gentle rains fall frequently and atmospheric conditions are favorable so there is little critical drying.

Most sections of the United States east of the Rockies have an annual rainfall greater than that of England, yet the watering problem through the summer is more difficult.

Evaporation during hot weather is rapid. Many of the rains come as heavy, dashing storms so that the water runs off the surface before it can be absorbed. There may be many such heavy rains during the summer with severe drouths in between. To offset this fluctuation and provide an evener moisture supply, supplemental watering is needed.

Importance of Watering

Taking the key from the British Isles, it is obvious that grass is apt to do better if a constant supply of moisture is available to it. That means the soil should not dry severely at any time. A watering program designed to replace moisture as it is lost will be good for grass. Generalized advice so frequently heard is to water seldom but deep. That may or may not be the answer to your lawn.

Except in arid climates, it is seldom necessary to water mature grass just for the sake of keeping it alive. But carefully watered grass should be a bright green throughout the summer.

On loam and clay soils a good turf can withstand severe and protracted drouth. It may turn quite brown, but unless cut too short it will revive with moisture. Sandy or gravelly soils may dry so severely that even weeds are killed.

The amount and frequency of watering depend upon the type of soil, height of cut, exposure of the lawn, temperature and rainfall.

Some soils have a greater moisture retaining capacity than others. An abundance of organic matter acts as a sponge to retain moisture and release it to the grass as needed. Silt, loam and clay soils retain water longer than sandy, gravelly soils.

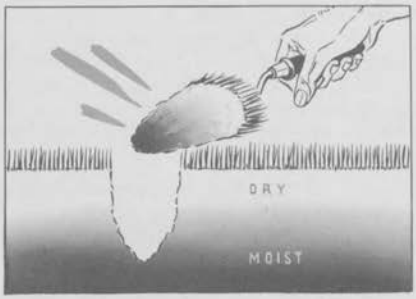
Steep slopes receive less benefit from rainfall and irrigation because of surface runoff.

When to Water

The amount and type of natural rainfall are the main factors affecting the timing of the watering program. A slow, soaking rain of a half inch will do more good than a driving downpour of several times that amount.

When rains have been missing for a week or two, it is time to examine the soil to see if it is getting too dry. This condition may develop much earlier in the spring than usually anticipated. Bright sun and brisk wind evaporate moisture quickly and may set up a need for watering much earlier in the spring than usually considered. It is not advisable to wait for the grass to show signs of withering. Once the soil gets dry to a depth of two or three inches, it is difficult to restore optimum moisture, especially if it is a heavy clay that bakes hard and cracks open.

A lawn watering program cannot be scheduled by the calendar. The need for water is best determined by occasional examination of the soil. A good plan is to cut a small plug 2 or 3 inches deep with a knife or trowel. If the upper inch or so reveals any sign of dryness, it is time to water. It is easy to replace moisture to that depth but if the soil is dry much deeper, the task is more than proportionately greater.



The sure way to determine need for water is to examine the soil

Some have learned to tell by the "feel" of the lawn underfoot when it needs water. As a soil dries, it loses resiliency of damp soil and there is a marked contrast to walking over a

part of the lawn that stays moist because of shade from the house as against a part exposed to full sun. This will be noted especially in one's heel prints.

Quantity of Water

As the soil dries out it should be necessary to replace only as much moisture as lost in the interval by evaporation and transpiration from grass leaves. From an average loam soil this loss on warm summer days may be 50 gallons per 1000 square feet. A six day total of 300 gallons would be the equivalent of a half inch rain. The length of time needed to replace the loss depends upon the sprinkler and water pressure. A good type at 20 pounds' pressure would need to run 2 or 3 hours.

In the case of a sandy soil, the moisture loss should be replaced long before it amounts to as much as a half inch of rain. While such soils absorb water quickly they hold less moisture and lose it more readily. They need to be watered more frequently, in smaller quantities.

It is easy to check the effectiveness of delivery from a sprinkler during any given time by placing coffee cans under the spray and measuring the depth of water collected. The cans should be deep enough that water does not splash out.

Watering Not a Panacea

Pouring water on a lawn in the summer will not make up for lack of plant food or other deficiencies in the maintenance program. Neither will it restore turf which has gone off-color because of fungus diseases, beetle grubs, chinch bugs, or injury from a dull or poorly adjusted lawn mower.

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MANY PEOPLE inquire if chlorine and other chemicals used in purifying city water are harmful to grass. If water is suitable for human consumption or even for laundry purposes, it is not likely to hurt plants. It is doubtful if enough such water would ever be put on a turf to cause any appreciable concentration of chemicals. The lime in some water may tend to alkalinize soils but not harmfully except under extreme conditions.

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CRABGRASS, is called watergrass by many because they associate it with watering and think "sprinkling" brings it on. Actually Crabgrass will grow in drier soils than will desirable grasses but like most plants it enjoys abundant moisture and thrives on it.

Proper Lawn Feeding

Hardly one lawn in five receives enough plant food. The number of outstanding lawns in this country would increase tremendously if all were to receive the right formulation of grass food two or three times a year.

EACH OF THE MILLIONS of grass plants that make up a lawn is a living organism. It must obtain minerals and water from the soil and carbon dioxide from the air. The quantity and combination in which these are available determine the vitality, the color and density of turf.

Unlike birds or animals, a grass plant cannot go wandering about in search of food. It must take what nourishment it can find in the limited zone of soil where it makes its home.

Good feeding promotes deeper, more penetrating roots that enable grass to draw on a larger volume of soil moisture, helping it through periods of drouth.

Moss is an often-present warning that soil is becoming deficient in plant food. Lime may be needed but usually feeding is the answer.

The Right Food

The first step in choosing a fertilizer for lawns is to get one that is compounded especially to feed grass. A general flower and garden fertilizer is seldom right because it is prepared to encourage the production of blossoms or fruit. In contrast, the need in lawn feeding is to encourage green leaf growth and deep, sturdy roots.

Nitrogen, Phosphorus and Potassium are the main elements which grass needs and which are deficient in most soils. Of these, the first is of primary importance because it is responsible for the green vegetative growth that is, after all, the lawn. A scientifically prepared grass food blends the three major elements in the right proportions.

Scotts TURF BUILDER is the one lawn food, compounded especially for grass, becoming more popular every year since its introduction in 1928.

Manures and Peats. The use of manures is not as prevalent as formerly due to their scarcity but many folks still have the erroneous idea that they are the best fertilizers. Such materials provide little actual plant food. A ton of manure provides less plant food than a hundred pounds of scientifically prepared grass fertilizer. Furthermore, manures are likely to introduce objectionable weeds. The real benefit from manures and similar substances results from the humus they add to the soil, improving the physical condition. They should be incorporated thoroughly in the soil before seeding or mixed with soil to provide topdressing material.

Other materials that fall into the class of manures, from the standpoint of being good sources of humus but negligible sources of plant food, include various types of peats and mucks. Actually these call for supplemental applications of plant food since bacteria working to disintegrate humus materials frequently exhaust the soil supply.

LIME *helps reduce excessive acidity but it is not a substitute for a complete plant food.*

When to Feed

Feeding should be planned to produce continuing maximum lawn beauty. It is not necessary for a lawn to be off-color for more than a few weeks out of the year when temperatures are very low.

Late Winter-Early Spring feeding is advised to get grass off to a good start in the new growing season. It is the time when grass generates new roots. They can be made sturdier and more extensive by early feeding.

The Scott Spreader has been especially designed to sow grass seed or apply lawn food, evenly and accurately. With one of these any homeowner can easily do his own seeding and feeding, also weed control.

Feeding in Late Spring-Early Summer will help grass through the trying hot months. Many use the Scotts WEED & FEED combination in May or early June, get double benefits from a single application in control of broad-leaved weeds and feeding of grass.

A half rate application of TURF BUILDER is suggested for lawns in mid-summer. This can be applied safely with a Scotts Spreader if the grass is dry at time of application.

Fall feeding with TURF BUILDER helps grass recover from the effects of summer heat and drouth. It encourages the lateral spread of the roots by supplying nutrients over the winter when there is important root activity even though the grass is dormant.

Soil Testing

A good laboratory test of soils will establish two things (1) the physical classification of the soil sample, and (2) the pH of the soil, that is, whether it is alkaline, neutral or acid in reaction. The former will provide the clue to soil handling and possible modification, the other as to the need for lime.

Scotts Lawn Research Laboratories of Marysville, Ohio provide a soil test service at the nominal charge of a dollar per sample, including report and recommendations.

Many Lawns Need Lime

The use of lime is important in lawn building and maintenance over a large part of the country. The exceptions are the limited areas of the Mid-West where soils are mainly of limestone derivation, and the more arid lands of the West.

Map adapted from data in USDA Farmers' Bulletin No. 1845

LIME MAP.
A general guide subject to local variations.

DARK GRAY—Lime probably needed every few years.

LIGHT GRAY—Soils mostly of lime derivation not likely to need lime but should be tested occasionally.

WHITE, also west of Lime line — Doubtful if lime needed unless woods earth, peat or muck added in large amounts.

It is a good idea to learn from actual soil test (above) if a lawn needs lime. Otherwise a safe rule to follow would be to apply raw ground agricultural limestone according to the chart on the map at 50 pounds per 1000 square feet (50 by 20 ft.)

Moss in Lawns

The fact that moss is often found on neglected land around fallen tree trunks, on the roofs of old buildings, indicates it is very much at home on poor soils. Moss frequently occupies places too impoverished to support other plant life.

The presence of moss in a lawn is not of itself an indication that the soil is "sour" or acid. Lime may be needed, but its over-use may encourage the development of moss. Moss is usually an indication of lack of fertility or poor drainage or both.

If drainage is obviously the problem, it's advisable to correct the condition if possible. Regrading or fill-in of low places may be called for or the installation of underground drainage.

An easier answer is provided if moss develops because of an inadequate feeding program. In such instances it is ad-

visable to rake out the moss, apply TURF BUILDER and repeat monthly through the growing season.

Miracle Chemicals have been promoted with regularity through the years with claims of fantastic results on the lawn or in the soil. One after another these have been discredited, not only in the field of fertilizers but also in hormones, vitamins, seed treatments and growth stoppers. When it comes to nutrients for grass, the complete and specific lawn food supplies all that grass needs if used in a steady repeat program.

Control of Weeds — Non-Grass Types

PROBABLY the simplest definition of a weed is: "Any plant growing out of place." Thus a garden plant springing up in the lawn is a weed, as is the finest grass in a flower bed.

Dr. E. R. Spencer, author of an excellent book on weeds, says: "Of all the forms of nature . . . nothing is so sure to come into one's life as weeds." Some folks feel that in this respect their lives have been full indeed.

In lawns, certain grass plants are just as obnoxious as dandelions, buckhorn, plantain or daisies. Thus the subject of lawn weeds necessarily includes grass-type weeds as well as the broad-leaved plants which are more commonly considered weeds.

Now it is possible to clear a lawn of most unwanted growth — grass weeds as well as others — by easy applications of chemicals. Moreover, this can be accomplished without permanent injury to the desirable lawn grasses.

Modern science is responsible for the development of selective weed controls. One type of chemical effective against most dicotyledons (*plants emerging with two leaves*) has little effect on monocotyledons (*one leaf, e. g. grains*) and has been available for several years. Clovers and most garden plants are "dicots." Grasses, desirable and otherwise, are "monocots." The dicots are successfully eliminated from lawns because a dosage of dichlorophenoxyacetic acid 2,4-D that proves their undoing is relatively harmless to grasses.

The selective action of a very minute amount of 2,4-D is its most startling feature. Large, healthy dandelions and other susceptible weeds disappear in a few weeks while surrounding grass remains unharmed.

In its early development this nemesis to lawn weeds could be applied only as a spray. Admittedly this was a great advance over hand-digging both in effectiveness and in labor saving. However, the extra work of carrying water, pumping

Volunteer growth of weeds, clover and grasses. No seed was planted. This mess sprouted from dormant seeds in the soil in the matter of a few weeks in the spring.

up pressures and the need for specialized equipment stimulated Scotts Lawn Research into developing selective control for broadleaved weeds in two easily used dry compounds.

1) 4-XD — *a clean, granular free-flowing weedicide*

2) WEED & FEED — *combining the same effective weed control with a special fertilizer to simultaneously stimulate the grass.*

Either product is quickly applied with the same convenient two-wheeled spreader used for seed sowing and fertilizer applications.

Clinging 4-XD particles mean goodbye to weeds!

Effects Are Good

Practically any lawn can be cleared of dicotyledons with no injury and little or no discoloration to the grass. A good time to do this is during periods of active weed growth, except in very hot and humid weather.

The dicots vary in their resistance to chemical weed controls. Clover is one of the more resistant species. Generally it is not destroyed but growth is retarded, particularly its tendency to bloom. This is considered an advantage because profuse blossoming is one of the serious objections to clover in lawns.

Some plants are more resistant to the action of the 2,4-D chemical. The list includes the low growing, vining type of weeds such as chickweed, speedwell, trefoil and ground ivy. Usually they require repeat applications in warm weather at 3 to 4 week intervals.

Wild garlic or wild onion infestations are reduced substantially if application is made in *late winter,* about the time growth emerges, with a follow-up in two or three weeks.

Authorities recognize the value of feeding grass at the same time weed control is used. This strengthens the turf, enabling it to fill out and take over where the weeds had been. Lawn food can be put on separately although the more convenient plan is to use Scotts WEED & FEED which does a simultaneous job of feeding the grass as it clears out broad-leaved weeds.

Where weed stands were heavy it may be necessary to sow seed to fill in the bare ground. If the soil is reasonably moist, it is safe to sow seed a week after applying chemical weed control.

May Be Slow

Susceptible plants begin to show the effect of 2,4-D within a matter of days — if growth is active. On the other

hand if the weather is cool or the soil dry, little effect may be noted until good growing conditions prevail. At times weeks may elapse before the weed destruction is evident. The action of an application may be delayed but is not apt to be lost.

Weeds Ever With Us

The illustration on page one of this chapter exemplifies the spontaneity and longevity of weeds. The growth is all volunteer, covering a period of a few weeks. Nothing had been added to this good garden soil, which had been under intensive cultivation the previous year.

These volunteer weeds came from seeds in the soil which obviously were over a year old. As a matter of fact, agricultural research has proven seeds may live in the soil 50 years or longer.

Not Screened Out. Sometimes weeds are introduced and at a high price. Manures, topsoil, native peats, black dirt — any of these will carry a substantial weed seed content just the same as any object will carry germs. Frequently the claim is made that these materials are weedfree because of screening, but this is not true because most weed seeds are so tiny that they will slip through any screen that would pass soil particles.

It is possible to sterilize soil to kill weed seeds but it is seldom done because of the great expense involved in heating soil to temperatures of 200 degrees F. and keeping it there for at least a half hour.

Chemicals may be used to destroy weed seeds in soil that is under cultivation such as in new lawn preparation. Several weeks time must elapse before seed can be sown.

THE home owner can insulate the outside of his home against the hot summer sun with green trees, shrubs and a good lawn. From the standpoint of summer comfort, a thick heavy turf keeps the soil cooler and reduces carry-over heat from daytime into evening. *Tests have shown that grass terraces in full sun can be 20 degrees cooler than adjacent paved areas.*

Control of Weeds — Crabgrass

OF ALL OBSTACLES to good lawns, Crabgrass is probably Enemy No 1. Crabgrass is strictly annual, volunteering from seed as the soil warms in late spring or in the summer. Unless checked, its claw-like spreading tentacles will crowd out desirable grasses and take possession by mid-summer. Crabgrass then shoots off ugly wiry seed heads that are extremely difficult to mow. The first heavy frost finishes the plants but before that time, millions of seeds will have been dropped to germinate another year.

The chemicals controlling non-grass weeds such as dandelions will not selectively control grass weeds. Some years ago, however, scientists at the University of Rhode Island noted that some forms of mercury had the ability to select between grasses. They established the fact that certain dosages, properly administered, would prove the undoing of Crabgrass without permanent injury to desirable grasses.

Scotts Lawn Research developed a practical commercial product, given the name of SCUTL. On the market since 1950, it has been proven as the easy-to-use answer to the Crabgrass problem. It is a dry, granular compound, quickly applied with the same spreader used to sow seed or to distribute fertilizer. SCUTL can do a thorough job if properly used. In a sense it is a lawn medicine and like most medications, one dose is not enough.

Knowledge Is Power

To conquer Crabgrass, it is necessary to understand its habits of growth and to be able to recognize it in its early stage of development. A few innocent looking sprouts of light green, stubby grass may foretell trouble in a lawn. The sketch represents Crabgrass in the two-leaf stage, the beginning of one of the slickest subversive operations in the plant world. From one of these sprouts a plant spreading out as much as two feet may develop almost unnoticed within a period of ninety days.

Crabgrass has different names in various localities. There are many varieties, mainly of the genus Digitaria or Syntherisma. Other English names in common use are *wiregrass, water-grass, finger grass.*

Control. The procedure for control of Crabgrass will depend upon the season or progress stage of the pest when the campaign against it is begun. As with most things, the earlier start is better but if Crabgrass is growing in a lawn, the time is "Now." SCUTL is the weapon and its strategic use in three different situations is outlined below:

1. Late Spring The control action of SCUTL affects either the plant or the germinating seed. It is possible to forestall later trouble by having SCUTL on the ground so the sprouts of Crabgrass pick up a lethal potion as the first leaf emerges. The timing will depend upon when the soil is subjected to a couple of weeks of real warming sunshine. This is usually about time dandelions are blossoming, late tulips are in full glory.

A total of five or six easy spreader applications is made at intervals of two to three weeks. Some varieties of Crabgrass may germinate after this program necessitating a clean-up treatment in mid or late summer.

2. Mid-Summer If the late spring program has not been carried out, Crabgrass will be growing actively by the time rambler roses have bloomed and summer seems definitely at hand.

Some are fooled by Crabgrass in its early stages because the bright yellow-green sprouts are not ugly, though the leaves are broader than desirable grasses.

By mid or late June the spreading and branching phase of Crabgrass is usually under way. Since growth is tougher and more rapid in hotter weather, the interval between applications in this program is 5 to 7 days.

After the second application in this series, a distinct

yellowing followed by browning of Crabgrass plants will be noted. If this does not occur, then some variety other than Crabgrass is the lawn culprit. The list of summer annual grasses which are not controlled by chemicals includes: Foxtail, Goose Grass, Witch Grass and Dallis Grass (Paspalum). If in doubt whether your problem is Crabgrass, send a specimen for identification to Scotts at Marysville, Ohio; Cranbury, New Jersey; or Palo Alto, California. Wrap in foil or wax paper to prevent drying but do not moisten plants.

3. Late Summer The real orneriness of Crabgrass may not be recognized until late summer when it sends out reddish or purplish seeding spikes that are wiry and extremely tough to mow. By then Crabgrass will have smothered much desirable grass but even so, control efforts are very much worthwhile. Future trouble may be lessened by preventing further spread and seed development, but quick action will be needed if Crabgrass has grown unchecked into August.

The late season treatment is SCUTL at 5 day intervals applied to damp vegetation.

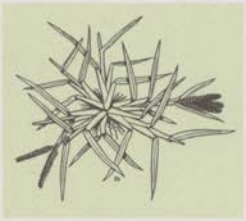
Other Grass-Type Lawn Weeds

WHILE SELECTIVE chemical controls for Crabgrass have been discovered, no such success can be reported for various weed grasses, most of which are annuals. Many resemble Crabgrass so closely in appearance and habit of growth that cases of mistaken identity are common.

The early spring program with SCUTL may catch some of these grasses if it is applied to the lawn before these weeds sprout. Such method is referred to as pre-emergence weed control, and requires a series of treatments in late spring.

Goosegrass

Goosegrass (Eleusine indica) is often confused with Crabgrass. It is also known as Crowfoot Grass, describing its flat, fingered seed stem arrangement. In some localities the name "Silver Crabgrass" is given this intruder though there is no family connection. Goosegrass, a self-seeding annual, appears later in the summer than Crabgrass but once started makes rapid growth. Goosegrass develops into a flattened rosette from a single fibrous root system. Its flat stems are silver-green. The finger-like seed-bearing spikes are coarser than those of Crabgrass. The best control is to use SCUTL in late spring—early summer before Goosegrass emerges.



Foxtail

Foxtail is a name generally applied to two grass groups, Alopecurus sp., mostly perennials, and Setaria sp., largely annuals. There are over sixty different grasses in these two groups, some common names being Pigeon Grass, Bottle or Bristle Grass.

FOXTAIL

The annual Foxtail species sprout a few weeks earlier than Crabgrass and are apt to be especially harmful in spring-seeded new lawns. Foxtail is less often a pest in well established lawns except in the Great Plains states where the seeds may be deposited in large quantities in dust or sand storms. Seeds of Foxtail species are distributed pretty liberally in soils throughout the country except in the extreme north.

Control. Prevent seeding by raking and mowing. Pre-emergence use of SCUTL may help if applied before Foxtail germinates in late spring.

Hot Weather Troubles

MID-SUMMER may be a trying period for lawn owners especially in extremely wet or extremely dry seasons. Insect pests are most apt to be bothersome in the months of June, July or August.

Where summer turf injury is observed, it is advisable to reflect on the weather of the preceding weeks, check soil moisture and look for insects. The effect of not enough rain is usually obvious and the answer too, as discussed in Chapter 6.

Too Much Moisture

Too much moisture in a poorly drained lawn may first be indicated by a yellowing of the grass. A soggy soil prevents air from reaching the roots and they suffocate for lack of oxygen. Saturated soil is also destructive to soil bacteria that make minerals available to the grass.

When soil is saturated the deeper roots are drowned and the grass is left with only a shallow root system. Then a brief interruption in the supply of moisture places the lawn in a most vulnerable position, because the surface soil dries quickly and no deep roots are alive to get the lower-lying moisture. This produces the paradox of grass in an over-watered soil dying because of a lack of moisture.

As soon as a shallow rooted situation is discovered, it is advisable to nurse the lawn back to health by daily watering with a fine spray. As the excess water drains from the subsoil, the grass roots will begin growing downward again. Then sprinkling should be less frequent and more thorough until a normal moisture condition is restored.

Turf Diseases

Though few realize it, various fungus diseases take quite a toll of grass. Often the injury is only scattered and the results simply a thinning of grass that may go unnoticed. At other

times conspicuous brown patches develop though not all browning of grass is caused by disease.

Certain forms of mercury provide the best protection against grass diseases. It happens that one of these mercurials is an important component of SCUTL, the Scott product for control of Crabgrass. More and more SCUTL is coming into use as a general "Lawn Treatment." This calls for regular applications beginning in late spring to provide the beneficial fungicidal effect of curbing grass diseases. At the same time SCUTL stops many annual weeds before they can emerge from the soil. Grass plants are like animals in that they are better able to withstand disease attacks if they receive the benefit of good care.

Leaf Spot. The activity of the Helminthosporium fungus causes the grass disease known as Leaf Spot. It is one of the first injuries to be reported following a wet spring season. When Leaf Spot attacks, the grass does not immediately disappear though it does develop lesions, brownish centers merging into black edges. This trouble can be forestalled by utilizing the fungicidal activity of SCUTL.

Brown Patch. The disease Brown Patch causes some grass to turn brown during the summer months. The responsible fungus, *Rhizoctonia solani*, is present in soils and on vegetation everywhere. It is usually inactive except during periods of hot, humid weather when grass is in a weakened condition.

The first evidence of Brown Patch is a whitish smoke ring blight followed by wilting and blackening of the affected grass as the disease continues. The attacked grass turns brown in ever widening patches roughly circular in outline. Unless the disease is very severe and long lasting, only the top growth is injured.

Lack of good air circulation makes grass more susceptible to Brown Patch so it often hits lawns surrounded by a dense growth of trees or shrubs or in other locations of poor air drainage.

In many cases Brown Patch can be prevented by remedying the factors responsible. If this is done and the disease is still troublesome, regular applications of SCUTL are suggested at two-week intervals.

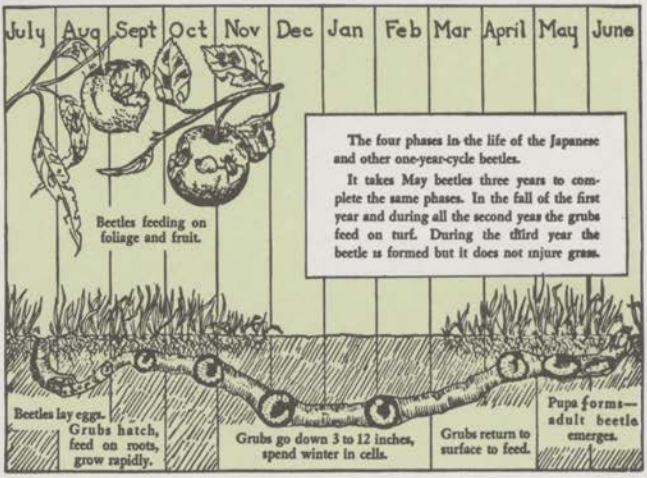
Control of Beetle Grubs and Earthworms

DURING THE PAST forty years many turfed areas in the northeastern portion of the United States have been ruined by the grubs of various beetles. The greatest damage is by grubs of those beetles having a one-year life cycle, namely, the Japanese, Oriental, and Asiatic Garden species. Grubs of May Beetles are less troublesome since they propagate in a three-year life cycle.

Turf damaged by grubs may first appear to be suffering from lack of water or from an overdose of fertilizer or weed control. The grass turns brown and dies in irregularly shaped patches. The sod is severed at the roots so that it can be rolled up like a carpet to expose a colony of feeding grubs.

Grubs of Jap Beetles cut off grass roots just below surface so that sod can be lifted up like a carpet. Grubs are of light cream color, usually curled in blunt crescent shape, ½ to ¾ inch long. Note comparison in size to man's fingernails.

If a period of severe drying follows grub activity, the lawn may be completely lost or the grass so weakened it is vulnerable to weed invasion, especially Crabgrass. The presence of grubs is often disclosed by flocks of birds scratching up the sod to get at the juicy food morsels. Beetle larvae are also a favorite food of moles, skunks and raccoons. Moles make burrows and the others tear up the sod, not to eat the grass but to be able to feed on the soil-borne grubs. Moles and skunks will forage elsewhere for food after grubs and their ilk have been eliminated.



Jap Beetles

The four phases (*egg, grub, pupa, beetle*) in the life of Japanese and similar beetles are completed typically in one year as illustrated in the chart.

Infested Localities. Since the Japanese Beetle was discovered in New Jersey in 1916, it has spread steadily, advancing 5 to 10 miles a year. It is thought to have been introduced around iris roots from Japan. The natural migration of Jap Beetles has been sufficient to infest practically all of the Atlantic Seaboard from southern Maine to Norfolk. Inland through most of New England, New York, Pennsylvania, Maryland, Virginia, West Virginia and eastern Ohio.

Aside from the natural spread, Jap Beetles have been accidentally transported to the west and south of the main infestation areas. They have become serious pests around Cleveland, Cincinnati, Detroit, Indianapolis and St. Louis.

May Beetles

The life cycle of the May beetle is typically of three years' duration, although these are one-year species.

From April to June of the first year May beetles are found feeding on a favorite food such as oak leaves. They mate at night, the female returning to the soil to lay eggs which

hatch in three to four weeks. The resulting grubs live on organic matter and roots until cold weather when they hibernate for the winter. They remain in the ground all through the next year to emerge as adult beetles the third year.

The May beetle is found in almost any state north of the Ohio River and westward to South Dakota. May beetles appear every summer because different broods mature in different years.

Control of Grubs

Until recently about the only control for grubs was to poison the soil with lead arsenate. This was fairly effective for short periods but had the drawback of requiring the handling of a virulent poison.

Some of the newer insecticides such as Chlordane are quite effective against grubs and are included in the SCOTTS LAWN CARE product for control of pests.

In areas of known infestation, it is a good idea to grub-proof the soil before seeding a new lawn or turf area. The selected insecticide is worked in during the final stage of soil preparation, along with fertilizer.

Earthworms in Lawns

THE ROLE OF EARTHWORMS in helping produce the fertile topsoil of this planet is of the utmost importance. These underground burrowing night crawlers, angle worms, fishing worms, are generally friendly to man.

One place they are not appreciated is on lawns and putting greens where they leave casts. These tend to dull mowers and smother grass as they are packed down.

Since the burrowing of earthworms improves water and air drainage in heavy soil, it does not seem advisable to discourage their activities unless damage is quite severe. Usually the appearance of casts is only for a limited time and the possible harm can be nullified by sweeping or brushing the area to scatter the casts before mowing.

If they must be discouraged, the pest control suggested for grub infestations will do that. Repeat applications may be needed since earthworms are endowed by nature to live with most anything in the soil. A build up of Chlordane, however, should at least keep them from extreme activities near the soil surface.

Control of Ants And Other Insects

ANTS do not directly harm garden plants or grasses although some species having very strong jaws are able to crack seeds and appropriate them for food. It is the earthen

mounds thrown up about the entrance to their nests that make the presence of ants undesirable. Besides being unsightly, the mounds sometimes smother young plants. The galleries or burrows which ants form in the soil disturb root growth by causing undue drying.

While ants do not feed on plants they are garden pests because of their habit of fostering aphids (plant lice).

Control Measures

The new chemical Chlordane effectively controls ants. It can be made into a solution and poured into the burrows or simply broadcast over an infested area.

A convenient dry formulation of Chlordane is marketed as one of the Scotts Lawn Care Products. This is easily broadcast over any outdoor area where ants are a problem such as in the lawn, flower garden or around the garbage can.

Poison Baits can be used to diminish the ant nuisance both indoors and out.

Where ants are a serious problem because of invading the house from the yard, an insecticide barrier around the perimeter of the house may keep them out. The granular form of Scotts Pest Control is easy to use for that purpose.

Termites

Termites resemble ants and are sometimes mistakenly referred to as flying ants, winged ants or white ants.

At times swarms of these may be seen emerging from nests formed under a lawn. The termites with wings are the true males and females. The soldiers and workers do not have wings. The workers are the destructive forms which are active in foraging and feeding on wood.

Because termite damage to wood is so much to be avoided, it is important that every home owner be able to recognize them. The accompanying illustration may aid in identification. The main difference between wingless termites and ordinary ants is that termites do not have the slender waist typical of true ants. The wingless termite workers are white and always work under cover.

A, adult form of termite, the kind that destroy wood; B, a true ant with the slender waist; C, winged form of termite.

If a colony is located, it should be promptly destroyed by one of the methods suggested for ants.

Growing Grass In The Shade

BRIGHT GREEN VIGOROUS grass in the shade zone is possible in most places and without too much effort. The answer is simply in furnishing adequate amounts of the basic needs of all growing things: food and water. This need is more critical for grass under trees because the tree roots have first call on the available soil nutrients and moisture.

Dense tree foilage filters out sunshine, but this is the least important factor. Lack of direct sunlight does not preclude the possibility of good turf. Protection from the direct rays of midsummer sun may even be a blessing.

Seeding. It may be necessary to sow seed under tree-shaded lawns more often than in the sun because of greater mortality of grass plants. Selection of seed is important although varieties that make the most attractive turf in the sun have the same advantages in the shade if properly cared for especially in the matter of moisture supply.

Feed, feed, and feed again, because the trees take so much nourishment from the soil. Feed at least spring, summer and fall and under severe competitions a half dose as often as once a month through the growing season. This is not much of a chore using a SCOTTS SPREADER. Besides helping the grass, regular feeding of the lawn under trees will supply nutrients for faster growth of the trees.

Watch soil moisture under trees. Because protection from the sun reduces evaporation, the upper inch or so of soil may re-

main relatively moist while the deeper soil is dried severely by the feeding roots of trees. A good size tree may take up a hundred gallons of water or more in a day. Aside from that, the lawn under the trees does not get as much benefit form summer showers. Nature has endowed most trees with a leaf arrangement that sheds rain to the outer edge of the spread of branches.

It is difficult to prescribe an exact irrigation schedule for all shaded lawns because of variations in soil, exposure and rainfall. Personal observation is the answer. If possible, the water should be delivered so it is immediately absorbed and does not form in puddles over the lawn.

There are some locations where grass does not thrive because of excess moisture especially in the early spring and late fall. Such a situation calls for regrading or installation of tile lines.

Cut high. Of almost equal importance to seed-food-water, is the matter of mowing. A short cut is all right in cool spring weather, higher cutting to 2 inches or more is better practice during hot weather.

Still higher cutting, up to three inches, may be advisable in places protected from the sun in the early part of the day and then suddenly subjected to direct rays during the hot mid-day hours. In such cases the broiling sun wilts the grass because the breathing pores cannot close quickly enough to avoid excessive transpiration. The leaves give off moisture faster than it can be taken up by the roots. Do not neglect cutting just because a higher growth is maintained. The mowing schedule should be such that the grass is cut as soon as a half inch of growth develops.

Sometimes thick growths of shrubs interfere with air circulation across lawns. If possible, thinning or pruning is advisable to give the lawn area cross ventilation, preferably in the direction of the prevailing wind for the area.

Therapy in the Anteroom

"You were so thoughtful **as to forward me an excellent loose-leaf binder containing the various lawn publications by Scotts, for my reception room at the office. It has had a very soothing effect on some of my impatient visitors in waiting; and they have darn near worn it out, passing it back and forth. I suspect that some of them have been coming in just to read up on their lawns."** ***(A District of Columbia Doctor)***

Lawn Renovation

AT TIMES IT IS DIFFICULT to decide what to do about a poor lawn, whether to tear up and rebuild or try to make it into a good lawn by surface treatments.

If a lawn is poor because of inadequate maintenance, surprising improvement can be made in just one season of intelligent care. Proper mowing, liming, feeding and weed control supplemented with seeding has worked wonders on many mediocre lawns.

It is certainly true that having good soil makes it easier to develop and maintain a good lawn. On the other hand, most lawns are growing in poor soil conditions and the cost of good loam, if it can be found, is usually prohibitive. The general advice then is to work with the soil in place, if it is actually soil and not stones, gravel or loose sand.

Investigation

An appraisal of the present condition of a lawn is recommended before investment of any particular time or money. After that it is well to determine a plan of action and proceed accordingly.

Check the Soil — Take soil samples as suggested elsewhere in this book in order to learn —

1. The soil classification — to know what you are dealing with.
2. The pH, which will indicate if your soil needs lime and if so at what rate.

Probe into the poorer spots or bare areas where you may find —

Buried building debris. Pockets of stone, gravel or loose sand — this should be removed to a depth of 6 or 8 inches and replaced with good soil.

Drowning of roots because of poor surface grade or impervious soil. Correct the grade by leveling with good soil. Some turf areas are poor because of compact hide-bound soils caused by trampling. Such areas should be loosened by spading and cultivating or opened up with deep perforations made with spading fork or aerator as described below.

Improving Soils of Established Lawns

It is difficult to improve the physical soil condition under established turf. There is considerable benefit from regular feeding as it encourages greater root growth and in the cycle some organic matter is added. Sowing Clover into the lawn may help in the same way.

Limited areas of heavy compact soil may be helped by perforating the ground to a depth of four or five inches and then brushing coarse sharp sand into the holes. Special aerifying tools are available or an ordinary spading fork may be employed. After being driven into the ground, the spading fork should be worked back and forth to enlarge the holes.

Spiked rollers and spike discs are sometimes suggested for this job but ordinarily they do not cut deeply enough to do any real good in soil improvement.

The application of topdressing soil to establish lawns is not justified except to level uneven surfaces or to provide a better bed for seeding bare spots. Soil fertility and grass growth are improved by regular applications of TURF BUILDER.

Procedures

Use of the Scotts Spreader is the key to most lawn activity. It is easy to set it to apply lime, TURF BUILDER, weed and pest controls as well as to sow seed.

Surface Roughing — Grass seed cannot germinate and take root if it remains on top of the ground. Actually it does not need much covering so it is not necessary to cultivate deeply before seeding. It is advisable to scarify, roughen, perforate or otherwise loosen the surface to give the seed a chance.

One of the best tools for this job is a heavy iron rake with the tines sharpened to cut ridges into the soil. Or a sharp flat spade or half-moon turf edger or ice hoe can be used to cut gashes. If seed lodges in such openings, it is more likely to find the needed moisture supply and ready anchorage for the grass roots. Even if this slicing of the surface cuts some grass roots, little harm is done as the injury will soon heal.

Top dressing with a good soil or compost is beneficial to any lawn, especially in the building up of a poor lawn. This is advised particularly after seeding if the material is applied to a depth of not more than ¼ inch. Deeper covering may delay or prevent germination.

Few of the raw organic or humus forming materials are suitable for use as a top dressing on established lawns. By their nature they are bulky and spongy so they do not readily become a part of the surface soil. Instead of spreading raw organic materials over a lawn, it is better to utilize them in making compost with soil.

The development of compost for top dressing purposes is more fully discussed in another chapter. One cubic yard of material will provide about a quarter inch on 1000 square feet.

The top dressing material should be screened through a ¼ inch mesh screen. Some are expert at broadcasting from a shovel, others scatter from a bucket or dump in small piles and spread around with the back of a rake.

It is well to rake or brush-in no matter how the top dressing is distributed. This is better accomplished if the grass is cut short before the operation is started. A flexible steel door mat is good for dragging top dressing into the sod.

Watering — Nature may provide needed moisture following early spring or early fall seedings. In dry periods, supplemental watering is needed if young grass is to be kept alive. Seed is not harmed if it remains dormant in dry soil but once the germinating activity is under way, a good moisture level is needed until the grass is well rooted.

The Plan of Action — *suggested for renovation of established lawns depending upon time of the year* —

Late winter — early spring

Apply lime if prescribed after Soil Test
Feed with TURF BUILDER
Rake out debris, scratch bare spots
If there is much of a growth of grass cut it off closely before seeding.
Sow grass seed
Mow at 1 or 1½ inches as growth starts

Spring to early summer

Apply 4-XD to control dandelions, similar weeds. Start watering as soon as surface soil begins to dry out.
Start SCUTL program to control annual weeds such as Crabgrass.
Provide a follow-up feeding.

Summertime

Continue or start SCUTL program to control Crabgrass.
Raise height of mowing to 1½ to 2 inches.
Continue watering
If surface is uneven, plan to level with good soil or regrade in early August so seeding can be done in late August or early September, the best time of the year.

Late summer — early autumn

Apply WEED & FEED to clean out dandelions, plantain, buckhorn while feeding the grass.
After next soaking rain, do necessary seeding.

Mid and late autumn

Lower cutting height to 1 or 1½ inches. Keep up mowing as long as grass continues to grow.
Remove leaves so they do not mat and smother grass.

INDEX TO *LawnCare*®

This handy book is a special condensation of material from a bulletin service Lawn Care, published six times yearly since 1923 to help folks develop better lawns.

If you have enjoyed your browse through this reprint and would like to receive the current issues of Lawn Care, just advise Scotts Lawn Research, Marysville, Ohio. A two-year subscription will be entered for you on a complimentary basis.

SCOTTS LAWN RESEARCH
10 Edgewood Terrace
Marysville, Ohio