

Underlying Causes of Turf Trouble

NUMERABLE futile attempts at turf improvement emphasize the necessity for an orderly scheme of procedure, which is fundamentally sound, with each operation performed in the order of its importance. Success and economy are the inevitable reward of such a program. But success depends upon a clear understanding of the underlying causes of turf trouble—and their remedies.

Careful examination of soil and turf is the first necessity. Drainage, kinds and amount of grass, soil texture and chemical composition should receive especial attention. Although of less importance, watering and mowing practices, control of insect and fungus diseases, should not be overlooked.

DRAINAGE: Obvious drainage needs are usually provided, but damage from seepage, and in northerly districts, detrimental effects of almost imperceptible pockets and depressions are overlooked.

Poor turf along lower hillside slopes is due usually to seepage. Damage occurs during fall and spring. Blue grass and fescue fare worst, whereas moisture-loving bents usually thrive. In these locations tile lines, placed at right angles to direction of flow, and backfilled with gravel, should precede improvement by reseeding or fertilization. In aggravated cases, besides tile, encouragement of bent may be necessary.

Clover, knotweed, or other weeds are often the sole occupants of imperceptible pockets and depressions because blue grass and fescue winterkill each year. Tile drainage is not the answer, because deep frost prevents tile from functioning when injury occurs. Improved surface drainage or the use of bent grass is the permanent solution.

HERBAGE: A survey of existing herbage is always essential. It discloses possible need for reseeding, weed eradication, or grub control, in addition to fertilization.

When desirable grasses, adapted to local soil and climate predominate, and turf is uniform but thin, extensive reseeding is not necessary. These grasses spread naturally to form dense turf in the presence of ample food and moisture. Except for spot seeding on occasional bare areas, the only other justification

for reseeding is to introduce favorable grass varieties on areas such as those just mentioned.

Ordinary weeds and clover can be suppressed by fertilization. Special treatment is necessary only on areas which are practically devoid of grass. Reseeding and fertilization should follow weed elimination.

Where grubs abound, their control with lead arsenate should precede, or accompany, fertilization.

TOPDRESSING NOT ALWAYS NECESSARY:

Contrary to the belief of some, topdressing with soil is not necessary to eliminate objectionable small "cuppy" lies. They disappear as existing grass spreads. Fertilization, not topdressing, is the economical solution.

It is futile to attempt material modification of heavy soils, which are already in turf, by dressing with sand, peat, or manure. It is more sensible to encourage denser turf development. Even on sandy soils, installation of an irrigation system may be more effective, and less expensive, than extensive topdressing.

Fairway irrigation eliminates moisture as a growth retarding factor, but is not the sole solution of turf improvement. Unless associated with fertilization, clover and weeds may overshadow grass.

NEED FOR LIME: Next in order comes need for lime and fertilization. In devising a sensible program, reliable determinations of soil reaction and plant food deficiency would be extremely useful. Satisfactory methods are available for soil reaction. Some phosphorus methods are useful; potassium methods often show need for potash not substantiated by field experience; all nitrogen methods are of no practical value.

First it is necessary to decide upon possible need for lime, phosphorus and potassium, even though they are secondary to nitrogen in any scheme of fertilization on established fine turf. Unlike nitrogen, their use is not a major necessity each year, even when soil deficiencies are acute.

Soil reaction tests determine need for lime. Definite need is indicated only when soils are moderate to strongly acid. With borderline soils, no serious harm will result from delay until definite need is established by field tests on trial strips. Kentucky blue grass needs more

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lime than fescue or bent; larger quantities should be used on heavy soil than on lighter soils of the same reaction.

PHOSPHORUS AND POTASH OVER-EMPHASIZED: Often on established turf, need for phosphorus has been over-emphasized. Generous applications of phosphate should be confined to soils known to be low in available phosphorus. A heavy initial rate tends toward deeper penetration before fixation occurs. When clippings are not removed, at least 2 to 4 years can elapse before additional phosphate is needed in quantity. With moderate to high available soil phosphorus, a fertilizer containing about one-half as much phosphoric acid as nitrogen will give entire satisfaction.

Excepting peat, mucks, and extremely sandy soil, potash is seldom needed on fairways or lawns. Most soils contain ample potassium, which is augmented upon decay of clippings. The excessive use of potash will encourage clover.

NITROGEN FEEDING KEY TO SUCCESS: From then on, nitrogen feeding is the key to successful fairway and lawn management. Annual feeding is best practice, because appreciable loss may occur from leaching, and sometimes from denitrification.

On nitrogen-starved turf, heavy rates spring and fall are justified until turf of desired density is obtained. After that, rates can be reduced to a bare maintenance level, and possibly confined to one application a year. In districts where crab grass is a serious pest, major nitrogen feeding should be in the fall, with lesser rates in spring so as not to encourage crab grass unduly.

The true organic nitrogen fertilizers can be applied, even in the generous quantities needed on impoverished turf, in a single application; but with soluble fertilizers, split applications are necessary to avoid serious burning.

ESSENTIAL FACTORS: Contrary to the general impression, good turf can be developed from seed short of two to four years. Besides fertilization, success depends upon proper drainage, thorough seed bed preparation, selection of grasses suited to local soil and climate, and the use of ample seed of good quality.

Quick development of uniform coverage depends upon ample phosphate to stimulate initial root development. For this purpose, superphosphate is superior to bone meal. Ni-

trogen is needed also to promote healthy vegetative growth.

Because golfers demand turf perfection at all times, irrespective of weather, greens maintenance is always a problem.

Without adequate drainage and soil of proper texture, it is almost impossible to cope with adverse weather. Good drainage is an absolute essential. This applies to surface as well as subsoil drainage. Pockets and depressions which hold water are apt to cause serious trouble, both in summer and winter. The necessity for good subsoil drainage is obvious. Suffice to say that the tendency is to space tile lines too far apart. Texturally, the soil must be sufficiently open to facilitate rapid removal of surplus water, yet possess enough fine material to insure adequate water-holding capacity. A supply of organic matter is necessary also, not so much to increase water-holding capacity, but to enable greens to hold a pitched ball without the necessity of overwatering. In excess, organic matter produces spongy surfaces, and its large water-holding capacity accentuates turf loss in wet seasons.

SAND AND MOISTURE ABUSES CAUSE TROUBLE ON GREENS: A few still make the mistake of topdressing greens with pure sand and peat. These layers interfere with free movement of soil moisture, and are the cause of frequent trouble in summer.

On greens, irrigation is a necessity, yet the privilege of water is often abused. The tendency is to overwater, especially on greens in sheltered locations. When greenkeepers exercise more care in the selection and training of water-men, troubles will be lessened.

Greens present a slightly different fertilizer problem than fairways. Phosphoric acid and potash increase in importance, because clippings are removed. Their use spring and fall will suffice. Then feeding becomes a matter of nitrogen. Major applications should occur in spring and fall, with summer nitrogen feeding at light rates only.

Greens can become too acid even for bent grasses, so when tests show soils are moderate to strongly acid, the judicious use of lime is warranted.

In times of stress, when more or less turf loss occurs, the underlying cause must be determined before corrective treatments are tried. Otherwise trouble may be aggravated rather than relieved.

(To be continued)

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