

TIMELY TURF TIPS

NITROGEN SHORTAGE PROMOTES DOLLAR SPOT

Continuous nitrogen starvation is one reason why some greens are constantly afflicted with dollar spot. Occasional severe attacks are common on others because of periodic, acute nitrogen shortage.

Some clubs economize on fertilizer to lessen need for fungicide. Actually, the opposite is true, because nominal fertilization reduces dollar spot. Hence, fertilizer cost is more than offset by the saving in expenditure for more expensive fungicide. A few clubs purposely starve greens at all times, laboring under the delusion that nitrogen is the sole cause of all turf ills. Despite constant fungicide treatment, dollar spot is their constant companion. Clover and weeds are an added scourge.

That excessive nitrogen must be avoided always is an established fact. It produces tender succulent grass, which cannot withstand heavy traffic, or cope with any one of the diseases peculiar to greens. But the opposite extreme (nitrogen deficiency or starvation) is bad also, because it promotes dollar spot attack. This is especially true in cooler regions where dollar spot is the principal disease. Farther south, spring and fall are the likely seasons for attack.

In late spring or early summer, dollar spot often hits hard. Attacks are devastating and most likely when inorganic fertilizer only is used in early spring. Rains and irrigation quickly leach-out any nitrogen not taken up by the grass. Then the stage is set for a bad attack. Turf growth slackens and color fades just before dollar spot becomes rampant. Exactly the same situation arises many other times each season when water-soluble inorganic fertilizer is the sole source of nitrogen.

When water-insoluble organic fertilizer (Milorganite) is used in early spring and again in May or early June to supply most of the nitrogen, the danger is lessened. First, because leaching loss is negligible, and secondly, because soil processes furnish nitrogen as needed. Thus, turf is always healthy, so it can resist attack. This is an established fact based on experience at many clubs.

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THESE questions and answers won a trip to the Greenkeeping Supts. Assn. annual convention for Robert Mitchell, supt. of the Edison Club, Rexford, N. Y. A contest was conducted by the GSA for the purpose of securing specimens of membership examination papers. Candidates for membership in the GSA are hereafter to appear before examining boards. Mitchell's paper was considered by the contest judges to give an excellent picture of the scope of a greenkeeper's problems, and one which would form a basis for board knowledge requirements on future GSA entrance qualifications.

QUESTION 1.

a—List six of the chemical elements necessary for plant growth.

Nitrogen, phosphorus, potassium, calcium, iron, magnesium.

b—What are the three elements that most soils are deficient in?

Nitrogen, phosphorus, potassium.

c—Tell briefly how a plant gets its food from the soil.

A plant takes its food from the soil in solution, through its roots, by a process called osmosis.

d—What things or conditions besides chemicals are necessary for plant growth?

In addition to chemical elements a plant must have sunlight, heat, moisture and air in order to grow.

QUESTION 2.

a—Describe the ideal soil for putting greens.

The ideal soil for putting greens is a sandy loam which is well supplied with organic matter.

b—What effect would the addition of each of the following have to a soil: clay, sand, organic matter?

The addition of clay to a soil would increase its water holding capacity, make it slower to drain, and make it pack more.

The addition of sand would decrease its water holding capacity, make it drain and dry out quicker.

The addition of organic matter would increase the water holding capacity, drain off excess water quicker, and tend to prevent packing.

c—Explain the meaning of pH when used in reference to a soil.

pH refers to the degree of acidity of a soil, pH 7 being neutral, above 7 being increasingly alkaline, below 7 increasingly acid.

d—Of what value are rapid method soil tests to a greenkeeper?

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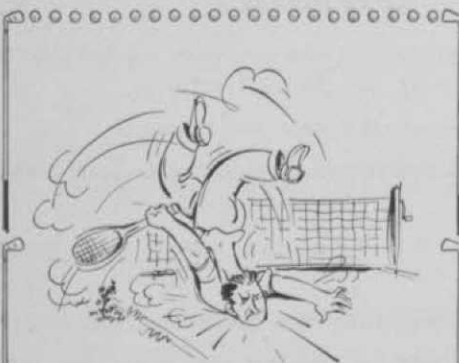
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Rapid method soil tests if used over a period of time will show whether acidity and plant foods in a soil are increasing or decreasing and thus the need of changes in fertilizer or topdressing programs.

QUESTION 3.

a—What does the term "a complete fertilizer" mean?

A "complete fertilizer" is one that contains nitrogen, phosphorus and potassium.

b—What is the difference between organic and inorganic fertilizers?

Organic fertilizer is one made from plant or animal tissue; inorganic from other materials such as chemicals or minerals. Organic fertilizers do not work as fast and last longer than inorganic in the soil.

c—Name six common materials used as fertilizer—tell whether each is organic or inorganic, what plant food each contains and the approximate percentage of each plant food.

Nitrate of soda, inorganic, nitrogen, 25%; sulfate of ammonia, inorganic, nitrogen, 20%; superphosphate, inorganic, phosphorus, 16-20%; cottonseed meal, organic, N—6%, phos.—2%; muriate of potash, inorganic, potassium, 48%; activated sludge, organic, N—6%, phos.—3%.

QUESTION 4.

a—What effect on turf would a poorly drained soil have?

A poorly drained soil would make a shallow rooted turf, a weak, thin turf, and if excessively badly drained would even cause complete loss of the turf.

b—What advantage does the use of tile for drainage have over the use of open ditches?

The advantage of tile over open ditches is that it does not cut up fields, causing no inconvenience in use of machinery. If properly laid, needs less upkeep than open ditches.

c—Give the approximate depth, spacing, grade and size of tile to use in drainage work.

Tile should be laid from 18 inches to 3 feet deep, lines should be from 20 to 60 feet apart, with a pitch or grade of from 6 inches to 5 feet per 100 feet. Tile less than 4 inches in diameter should never be used. Up to 2,000 feet of 4-inch tile can be used before increasing to 6 inch.

d—Describe three conditions that call for tile drains.

Three conditions calling for tile drainage are seepage from a higher area that needs to be diverted, soil that is underlaid by hardpan, a heavy clay soil.

QUESTION 5.

List six varieties of grass commonly used on golf courses. Tell what section of

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the course they are suited to, what kind of soil they prefer, and as light, medium or heavy their fertilizer and their water requirements.

Creeping Bent—greens, sandy loam, fert. heavy, water heavy; Velvet Bent—greens, sandy loam, fert. medium, water medium; Kentucky Blue—fairway, clay loam, fert. heavy, water heavy; Chewings Fescue—fairway, sandy loam, fert. medium, water light; Red-top—fairway, sandy loam, fert. medium, water medium; Colonial Bent—greens, sandy loam, fert. medium, water medium.

QUESTION 6.

a—Name three common diseases of turf and briefly describe their appearance, tell what causes them, and give the methods of controlling them.

Large brown-patch—appears as circular patches, 6 to 15 inches in diameter, brown in color, worst in hot, humid weather. Controlled by using bichloride of mercury, calomel, or a mixture of the two, applied to the turf at intervals of from 5 days to two weeks, depending on the weather. Caused by a fungus, made worse by over-fertilization.

Dollar-spot—appears as brown spots the size of a silver dollar; caused by a fungus. Controlled by the use of calomel.

Snow mold—circular areas about the size of brown-patch, but found only in the winter or spring and is gray in color. Caused by a fungus that works at low temperatures. Controlled by the use of bichloride and calomel applied late in the fall.

b—Name three insects or animals that injure turf—describe the injury and give the methods of controlling them.

Earthworms—injure turf by the casts about the size of a half dollar which they deposit on the greens. They are controlled by applications of arsenate of lead.

Japanese beetle—cause injury by feeding on roots, turf in large areas turning brown and being loose can be lifted up like a rug. Controlled by arsenate of lead treatments.

Moles—cause injury by burrowing just below the surface and thus making ridges in the turf. Controlled by cyanogas, trapping and poison bait.

c—Name four weeds that are troublesome in turf—tell in what part of the course they are most troublesome, and give the methods of controlling them.

Chickweed—troublesome in greens, controlled by application of arsenate of lead to the patches.

Dandelions—troublesome in greens and fairways. Controlled by hand weeding in greens, generally not controlled in fairways, although sodium arsenite has been used in some sections.

Plaintains—troublesome in greens and fairways. Control same as dandelions. Wild carrot—troublesome in short roughs as blossoms are white. Controlled by frequent mowing to keep from developing seed heads.

QUESTION 7.

a—What are the reasons that you topdress greens?

Greens are topdressed to smooth them up, to cover the runners or joints of creeping bents, to build up a suitable layer of topsoil in some cases, and to use the compost as a fertilizer carrier in some cases.

b—What methods and materials do you use in preparing compost for topdressing?

A good method to prepare compost is to spread all the material in thin layers so that it can be mixed with plows and harrows. The materials consist of topsoil, sand, sod, grass clippings, manure, etc., in proper proportions to make an ideal soil (sandy loam, high in organic matter). After mixing, cover crops may be grown on the beds and turned under until the compost is to be screened for use.

c—What are the advantages and the disadvantages of sterilizing compost?

The advantage of sterilizing compost is

that it kills a great percentage of the weed seeds. The disadvantage is that the cost of sterilizing may be more than weeding costs if the weed seed were not killed.

QUESTION 8.

a—Approximately how often and at what rates should fairways be fertilized?

Fairways should be fertilized at least once per year, using from $\frac{1}{4}$ to $\frac{1}{2}$ ton of fertilizer per acre.

b—What are the advantages and the disadvantages of a fairway watering system?

The advantage of a fairway watering system is that it allows you to keep a soft green turf in spite of dry weather. The disadvantage is that the maintenance of the fairway, because of more mowing, more fertilizer, etc., in addition to the watering, is higher.

QUESTION 9.

Write, briefly as possible, an outline of greens maintenance for an entire year.

Spring—As soon as frost is out of ground and greens are solid enough to walk on, they should be cleaned of all accumulated trash such as brush, leaves, etc. They should then be rolled. As soon as growth starts they should be mowed. When growth is well started they should

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be topdressed and fertilized, using a complete fertilizer. In this district it will be late April before the topdressing is done. They should be topdressed and fertilized again in May and June. The applications for brown-patch should be started in the last half of June if we have normal weather.

Summer—The greens will be topdressed and fertilized lightly in July, and also in August if it is a dry season. If a very wet season, the fertilizer and topdressing will be omitted in August. Treatments for disease (brown-patch) will be continued through July and August, the time between applications depending on the weather. Hand weeding for dandelion, plantain, etc., and arsenate of lead applications for chickweed will be done during the entire season from late spring to early fall.

Fall—In September the greens will be fertilized and topdressed heavily, using a complete fertilizer. Arsenate of lead for earthworm control will be applied at this time if needed. Any poor or thin spots will be seeded at this time also. Mowing is continued as long as there is any grass to cut, which ordinarily is until the middle of October, but sometimes until the first of November. Just before hard freezing, applications of fungicide are made to the greens which are subject to snow mold (usually the middle of November) and the cups are placed on temporary greens to remain there until growth starts the next spring.

Miscellaneous—greens are mowed at heights varying from $\frac{1}{4}$ to $\frac{3}{4}$ depending on the kind of grass, soil and weather. Watering is done mostly at night, the amount applied depending upon the kind of grass and type of soil as well as on the weather.

QUESTION 10.

List the major equipment needed for an 18-hole golf course.

- 1— $1\frac{1}{2}$ -ton dump truck.
- 2—Light tractors.
- 1—Set 5 or 7 unit mowers for fairways, plus one spare.
- 1—Set 5 or 7 unit mowers, with high roller brackets, for roughs, plus one spare unit.
- 1—Sickle bar mower—suitable for use with a tractor.
- 2—3 unit power greens mowers, plus one spare unit.
- 2—Sets unit for use on tees, with the above, plus one spare unit.
- 1—Spike roller, suitable for use with the power greens mower.
- 1—Topdressing and fertilizer spreader (for greens).
- 1—Fertilizer spreader (for fairways).
- 1—Tractor sod cutter.

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QUESTION 11.

a—How many men are needed (approximately) for an 18-hole golf course?

10 men are needed for an 18-hole golf course.

b—Show approximately how the jobs on the course would be divided amongst these men.

The labor would be divided among these men as follows:

- 1 man—mow fairways and roughs.
- 2 men—mow greens, tees, approaches, spike-roll greens.
- 1 man—move cups, tee markers, put out clean towels, etc.
- 1 man—do trucking (for both golf course and other departments).
- 1 man—take care of clubhouse grounds, cut flower beds.
- 1 man—mow with scythe, ditches, etc.
- 1 man—do repair work, carpenter work, etc.
- 2 men—available for work not routine such as topdressing, weeding, etc.

The above work is routine, and none of it occupies the full time of any of the men. With the last two men in the list as a nucleus, a gang of four or five men or more can generally be made up any day (especially in the afternoon) to do the jobs that are more efficiently done by a gang.

QUESTION 12.

If called to a strange course to diagnose trouble they were having with their turf, tell how you would determine what the trouble might be.

In trying to diagnose a turf trouble on a strange course I would:

1. Get a past history of fertilizer treatments, chemical treatments, mowing practices, etc.
2. Present history—of when trouble started, how it appeared at start, length of time developing, etc.
3. Examine the turf for disease, burns, mowing scars, etc.

4. Examine other strains of grass to see if more than one strain were affected.
5. Examine and test soil for drainage, puddling, excess acidity, alkalinity, etc., in both good and bad areas.
6. By a process of eliminating all of the above factors that seemed to be all right, try to narrow them down to one or more that were not good and thus probably would be what was causing the trouble.

QUESTION 13.

a—List six trees suitable for planting on a golf course and tell the kind of soil they prefer.

White pine—Sandy loam, fairly dry.
 American elm—Sandy loam, fairly wet.
 European larch—Clay loam, very wet.
 Norway maple—Sandy loam, moist.
 Silver maple—Clay loam, fairly wet.
 White oak—Clay loam, fairly wet.

QUESTION 14.

a—Should a greenkeeper keep cost accounts? Why?

Yes. Because they enable him to tell his club officials at any time where the money has been spent, what they have received for their money, whether old equipment should or should not be discarded for new, and what any particular job or section of the course costs to maintain. They also help him to estimate the cost of new items, such as new traps, etc., and to make up a reasonably accurate budget for the new year.

b—Should a greenkeeper make written reports to his chairman? Why?

Yes. Because they give the chairman, who probably is busy with his own job, a quick, easy and accurate answer to questions concerning the course. They also give the greenkeeper a record of things which happened in the past.

QUESTION 15.

a—What are the duties of a greenkeeper?

The duties of a greenkeeper are to directly oversee and be responsible to the green-committee chairman for the upkeep and maintenance of a golf course and any other departments, such as tennis courts, etc., as may be assigned to him.

In this respect he makes up the budget for the chairman's approval, hires, fires and directs laborers, makes up and carries out all fertilizer, mowing, watering and topdressing programs, etc.

He should make reports to the chairman at intervals on the condition of the course, things needed for the upkeep, work planned for the future, money left in the budget, and when some unusual problem arises, which he does not feel competent to handle alone, should ask him to hire outside experts for advice.

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