Proper Diagnosis of Trouble Helps Prevent Turf Failures

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There are a large number of factors which may cause turf failure. From his many years of experience the greenkeeper knows that the time to correct them is before they happen. He follows a maintenance program which is designed to provide, as nearly as possible, optimum conditions for grass growth. If he finds the turf turning brown and dying on his No. 8 green he first attempts to determine the reason for the failure. He knows that before he can take any steps to correct the trouble he must first find the cause. In doing this he makes use of all his specialized knowledge of soils, grass growth, diseases, insects, chemistry, etc.

Diagnosing the trouble is usually not too difficult but sometimes even the greenkeeper may be stumped and not able to pin the trouble down so that he can say, "This is it." By process of elimination even on these occasions he generally can rule out many of the factors causing turf failure and narrow the trouble down to two or three probable causes. It may be that further study and observation, or perhaps laboratory analysis is necessary to arrive at the cause of the turf failure.

Alertness on the greenkeeper's part enables him to recognize the signs of approaching trouble before it makes too much headway and by proper diagnosis he is able to apply corrective measures immediately. The following list, which is by no means complete, may be useful in helping to prevent turf failures or the proper diagnosis of their cause after they occur.

DISEASE — Almost all turf diseases produce characteristic symptoms which are usually easily recognized in the early stages. Bill Jones has learned to recognize the characteristic smoky ring at the outer edges of an area affected by large brown patch organisms. He is equally familiar with the small straw colored damaged areas resulting from small brownpatch. To confirm large or small brown patch or find the organism responsible if another disease is suspected a small piece of sod from the damaged area can be submitted to the Plant Pathology Department of your state experiment station. In doing this, however, one should be careful to obtain the sod sample while the disease organism is still active. Samples obtained a day or two after the damage occurs are usually worthless.

Cultural practices may influence disease outbreaks. Any practice or condition which tends to produce a weak, unhealthy plant will make the grass an easier prey for disease organisms and reduce its ability to renew growth after disease outbreaks.

INSECTS — Insect damage is usually specific and characteristic. Space does not permit detailed descriptions of these characteristics here but as our friend Bill Jones has done, every golf course superintendent should become familiar with the life cycle, stage of life cycle in which insect may damage turf, how damage is done, and control measures for all the insects which may damage turf.

The mere presence of insects does not indicate insect damage as many insects live in turf which are not harmful. If insects are present in injured areas, collect some and have them identified if you cannot make a positive identification.

CHEMICAL BURNS — Fertilizers, insecticides, fundicides, and weed killers are chemicals and will cause severe turf damage unless applied uniformly at proper rates. Never apply more of these materials than is actually required. Even though an excess of these materials might not burn the turf it would result in poor growth and appearance of the grass. With more of these strong chemicals being used on golf courses, great care must be exercised in preventing workmen from getting the wrong material. Sprayers used to apply more than one kind of material should be thoroughly cleaned after each use to prevent damage when used with other materials later. Spreaders and sprayers should be filled

where anything spilled will not cause injury.

MALNUTRITION — Unless the mineral nutrients such as nitrogen, phosphorus, potassium, manganese, magnesium, iron, calcium, boron, and other trace elements are supplied as required, the turf will have a poor color and appearance and make very little growth. Turf color and rate of growth are the best indicators of starvation. Fertilizer materials should be added as required to keep the grass growing at a reasonable rate and a healthy green color. Starved turf is thin, giving poor ground cover and poor playing surface and will not stand up under heavy play. Injuries heal very slowly and bare spots result. As a general rule, a complete fertilizer should be applied each spring and fall and straight nitrogen fertilizers during the growing season to keep the grass in a healthy vigorous state of growth. Nitrogen fertilization during the growing season has been found to reduce the severity of small brownpatch damage.

OVER FERTILIZATION — Too much fertilizer may be as harmful as not enough. Overfeeding with nitrogen will usually produce a weak, watery growth which is easily damaged by play and attack by disease. Light, frequent applications of fertilizer are much better than less frequent, heavy applications. A good rule to follow on greens and trees is to never apply more than one pound of nitrogen per 1000 square feet in any one application. Thus 5 pounds of 20% sulfate of ammonia or 20 pounds of 5-10-5 would be the most to apply at one time. During July and August it is a good idea to reduce each fertilizer application to not more than 1 pound per 1000 square feet of sulfate of ammonia or its equivalent. Such application should be made as often as required to keep the grass in a healthy state of growth.

DROUGHT INJURY — Even where modern watering systems are used the turf may die from lack of moisture. Soil conditions, watering practices, weather conditions, or a combination of these factors may result in an extremely shallow root system in greens. The grass roots may not go lower than the surface inch of soil. When the temperature is high and water loss from the soil and grass is very rapid, the moisture in this shallow root zone is soon lost. As a result the grass suffers from lack of moisture and turns an unnatural bluish-green color. Footprints will remain much longer since the grass is unable to return to its original position. Whenever these signs appear water immediately.

Greens and fairways also may have localized areas where because of soil or turf cover, water is unable to penetrate. After normal watering the soil in these areas is dry. Unless corrected by spiking or forking so that water can penetrate the turf will die.

OVER-WATERING — On many golf courses, because of soil conditions or location, all the greens will not require the same amount of water. Drainage, both surface and underground, and the soil texture will affect the ability of the soil to take up water. The rate at which the green dries will be affected by surrounding objects which may shade the green or reduce air circulation. Under such conditions it is very easy to overwater. A green which continues to receive too much water will soon have a compact puddled soil. When this happens, the air supply in the soil is reduced with the result that the grass roots are unable to obtain their required air below the surface inch or two of sod. A shallow root system with all the associated troubles is the result.

ACID SOIL — Physically, chemically, and biologically a strongly acid soil is unfavorable for grass growth. Water penetrates very slowly, it is easily puddled when wet, bacterial action is very slow, applied fertilizers are not efficiently used, and toxic elements may be released. Test your soil annually and apply sufficient lime to bring the soil to a pH of not less than 6.0.

MOWING TOO CLOSELY — Turf grasses differ greatly in their ability to withstand close mowing. Under optimum growth conditions most grasses can withstand closer mowing but mowing too closely will produce a shallow-rooted weak plant which is unable to compete with weeds or survive diseases and insect attacks.

MATTED TURF — Creeping bent grasses produce many above-ground stolons and unless these are kept in check by raking and mowing, a heavy, thick mat of turf will develop. This mat is harmful to grass growth and makes ideal conditions for disease and insect attacks. This mat usually develops on the approaches and collars of the greens where bent grass is used

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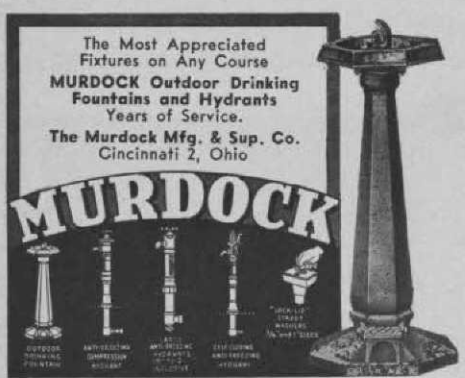

man generally gets fed up with his job quickly. He says to himself — maybe to others — "I joined the club to come out and have fun, not to carry a responsibility and get criticized. The hell with it." So he refuses to accept another term, quits to enjoy himself and leaves the superintendent to get "the hell with it."

PROPER DIAGNOSIS

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but where it is not maintained as the greens. Mowing at almost green height and raking may be necessary to keep this mat from forming. Greens turf even though mowed quite close may also develop this mat.

WASHBOARD EFFECT ON FAIRWAYS —As faster tractors have developed for mowing fairways, this condition has become more common. Although it cannot be classed as a cause for turf failure, this condition does spoil the playing surface and results in a poor mowing job. Fast mowing combined with improperly adjusted mowers will cause this washboard effect. If the reel is screwed down so that it is too tight against the bedknife, the rotation of the reel tends to raise the rear roller off the ground. As the mower moves down the fairway, the roller will jump up and down producing the rippled effect in the grass surface and eventually in the soil surface.

MOWER OUT OF ADJUSTMENT — A desirable putting surface on a green is primarily the result of good mowing. Unless the mower is cutting evenly and cleanly a poor putting surface will result. If the leaf blades are chewed-off by a dull, poorly adjusted mower, the cut ends will turn brown. Such mowing provides easy entrance for disease organisms.

POOR AIR CIRCULATION — Masses of trees or underbrush which shade a green and prevent air circulation cause the grass and soil to dry very slowly. Such a green will probably have more disease, and more trouble from puddled, compacted soil and shallow rooted turf. Remove underbrush and tree limbs up to 15 feet and whole trees if necessary to get adequate air circulation.

POOR SURFACE OR UNDERGROUND DRAINAGE — Grass cannot make healthy growth in a water-logged soil since the grass roots must have air. Poorly drained greens are usually problem greens in all respects. Adequate drainage should be provided

when the green is constructed, but if this has not been done, the installation of tile drains or changes in grade are a necessity.

LAYERING — Some years ago the practice of topdressing greens with straight peat or sand was quite common. Unfortunately the peat and sand do not mix with the soil above or below, but remain in a layer exactly where placed. As these layers are covered with other materials they interfere with water movement both up and down. In addition the grass roots will not penetrate these layers. A good rule to follow in topdressing greens is to use only a material which is an ideal medium in which to grow grass.

BLACK SCUM OR ALGAE — This is a green slimy growth which turns to a black hard crust when dry. Usually develops where drainage is poor or the turf has been damaged. Black scum is a sign that conditions are not satisfactory for healthy grass growth.

BAD JUDGMENT — No amount of expert advice or assistance is a substitute for sound judgment on the part of the golf course superintendent. The condition of any golf course is for the most part determined by the daily decisions of the man in charge. His decisions concerning such practices as mowing, watering, disease and insect control, fertilizing, etc. are the major factors in maintaining good turf on greens and fairways. The "experts" can give him assistance on technical matters but in the greenkeeper will rise or fall on the soundness of his daily decisions.