

Suggestions for Early Season Golf Turf Maintenance

By O. J. NOER

The expanded program of defense preparation caused by the critical world situation will have an impact upon golf turf management. Clubs are faced with the prospect of an acute labor shortage in 1951. Anything made of metal will be scarce and hard to get. Fertilizers, insecticides, and fungicides should be available in reasonable amount, although particular items may be temporarily unobtainable during periods of peak demand. Clubs should mechanize operations wherever possible in order to make the best use of scarce and high priced labor, and should arrange promptly to procure needed fertilizer, fungicide, and other staple items.

Greens should receive first emphasis in any maintenance program. When they are perfect players are less critical of the turf elsewhere. It takes some years to develop a first-class putting surface. The replacement of turf on neglected greens is expensive, besides being extremely annoying to the golfers.

Deep root systems are a big asset on greens and elsewhere for that matter. Severe wilting, followed by quick loss of turf occurs only in shallow-rooted greens. The

without an undue amount of mat if the soil is compact, poorly drained, or too acid.

Attention in the spring should be concentrated first upon the greens, particularly to the sole or mat of turf, and the condition of the root system. Surplus grass should be removed at about the time



Hand raking bent green in early spring to remove surplus grass.

growth starts. There are several good methods: severe brushing with a steel or fiber brush on the power greens mower, raking by hand or with a Delmonte rake in several directions followed each time with close cutting. The iron teeth on hand rakes should be ground to knifeblade thinness on an emery wheel. Otherwise they will tear out clumps of turf and disfigure the surface. Top-dressing should not be used until the sole of turf is thinned so the dressing makes contact with the soil below.

Those who use top-dressing only to eliminate an excessive amount of mat are doomed to failure, and surfaces will be worse for putting than they were before. The leaves and stems buried under the top-dressing resist decomposition for want of air. It is best not to top-dress until the mat is eliminated. Another alternative is to remove the surface mat of grass, then spike the greens with a heavily weighted spiker enough times to roughen the surface so the top-dressing makes contact with the soil.

Besides removing the mat on the green any surplus bent on the fringes around the green and on the apron should be removed in early spring. Fluffy bent is bad for play, and is apt to collapse and turn brown in the summer. Close cutting with the power



Closeup of thickly matted turf on bent green.

only way to keep shallow rooted grass alive during bad weather is light sprinkling several times daily for seven days a week. It is costly in manpower, but justified to keep the greens in a satisfactory condition for play. Deep roots eliminate the necessity for frequent watering. They simplify and reduce the cost of watering.

Heavily matted turf seldom has a deep root system, but roots may be shallow

green mower equipped with a brush followed by aerifying is the easy, effective method.

Study Green Drainage in Spring

Spring is a good time to study the drainage condition on greens, especially the ones located alongside or on hillsides. Poorly drained wet soils are cold soils, the grass stays dormant after growth starts elsewhere. Wetness restricts the amount of air in the soil resulting in shallow root systems. Where excessive wetness is suspected due to seepage from the side hill, one or more deep test holes made with a post hole digger will tell the story. The holes should be placed between the green and the adjoining hill. When the hole fills with water in 24 hours or less, tile drainage is needed. The line should be placed along the hillside above the green with the tile below the lowest point in the green. The trench should be filled with gravel to trap and lead the water down to the tile.

Some of the top-dressing used on greens contains too much clay and too little sand. This does not mean going to the other extreme of almost pure sand, with its extremely limited capacity to hold water, especially when the particles are very coarse. The sand should be reasonably coarse, but without too much fine gravel. Particles should vary in size from fine to coarse, with most of them in the medium to coarse sizes. Too much peat or humus is bad also. Then the soil stays wet too long after prolonged period of drenching rains. The humus content ought not exceed 20 to 25 per cent by volume. A top-

is better than a black one, if the humus in the latter is plastic in character.

The tendency is to top-dress less frequently than formerly, principally because good soil is scarce and top-dressing is expensive to prepare and to apply. Some clubs have not top-dressed for ten years, other do so only once or twice a year. The turf has not deteriorated provided enough additional fertilizer is used to compensate for the plant food formerly added in top-dressing, and the formation of a surface mat is prevented by close cutting and brushing or combing when necessary. Top-dressing to build a better surface soil is justified on greens where the soil is an



Spike disc mounted on a power mower used to spike deeply before top-dressing so the dressing will make contact with the soil below.

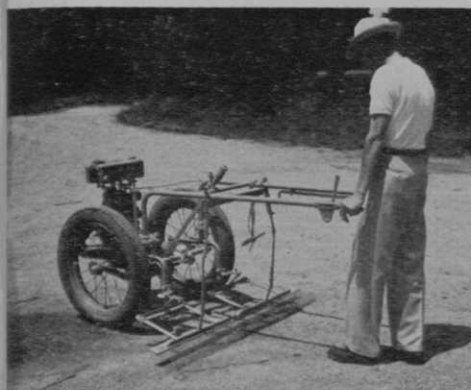
imprevius heavy clay. Tile drains are needed also.

Roto-tillers have been used in recent years to mix sand and humus with the heavy soil during the reconstruction of old greens. Sand is incorporated with the soil first and then the humus. Several greens rebuilt that way in Chicago and Cincinnati still have hard surfaces. Examination of a soil profile shows a compact surface layer about an inch thick and a satisfactory mixture below. Apparently the fines floated to the top during the roto-tilling. If these examples are typical, the use of the roto-tiller in its present form is hardly justified. Operating at a slower speed, or different teeth may be needed in order not to destroy soil structure completely. Otherwise it will be better to make the top-soil mixture off the green.

Use of Lime Desirable

The use of lime is desirable on soils which are more acid than pH 6.0. The annual rates should be 30 to 60 pounds per 1,000 square feet until a range of pH 6.0 to 6.5 is reached. When available magnesium is low, a dolomitic type of limestone should be applied. It should contain 20 per cent or more of magnesium reported as the oxide to eliminate any possibility of a soil deficiency in magnesium.

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Bill Stupp mounts two Del Monte rakes on an Overgreen to comb matted greens.

dressing mixture consisting of about one part loam soil, two parts sharp sand, and one part of humus is about right. These proportions are by volume and not by weight. The loam soil should not have a high clay content, most of the fine particles should be silt with not over 10 per cent of clay particles. A light colored soil

Notes from Western GA

Jerome P. Bowes, Jr., Chicago insurance executive, re-elected president of Western Golf Association, and with good reason . . . During Bowes' first year at helm, WGA continued increases started by ex-Presidents Jim Garard and Maynard G. "Scotty" Fessenden . . . Bag-tag sales for Evans Scholars fund upped 2,000 to give WGA more than 8,000 individual members during 1950 . . . Increases also recorded in total member clubs, assets and income to Evans Scholars Foundation . . . Best of all, 86 Evans Scholars now in college compared with 58 a year ago.

Aelred D. Geis, former Tam O'Shanter caddie, now in his junior year at Michigan State College, again leads Evans Scholars for Fall grading period with straight A's . . . Caddie-scholars now attend 24 schools, from Stanford and Washington on the West to Massachusetts Institute of Technology on the East . . . Biggest enrollment is at Northwestern University, where 39 are in attendance.

Avoiding a heavy Chicago concentration of officers, Western Golf Association elected Lewis F. Rodgers of Dallas as a vice-president and named Hi Lewis, Kansas City golf leader, as secretary during recent Annual Meeting . . . New directors include: Robert W. Goldwater of Phoenix, Paul H. Hyde of Buffalo, Leon Granz of Northwestern University, Edward E. Lowery of San Francisco, George C. Reeves of Chicago, Richard L. Snideman of Chicago, Gardner H. Stern of Chicago.

Only the date remains to be settled for the 48th Western Open Championship to be sponsored by the Quad-City "200" Golf Association . . . The WGA Open will be held either July 12 to 15 or July 19 to 22 at the Davenport, Ia., Country Club . . . More than 200 golfer-citizens of Davenport, Moline, East Moline, and Rock Island have guaranteed \$100 each by way of underwriting the Western.

SUGGESTIONS FOR MAINTENANCE

(Continued from page 27)

Among other things, excessive acidity has a tendency to restrict root growth as mentioned above.

A little hydrated lime often performs miracles during bad brown patch weather, and when a green scum of algae appears during wet spells. Benefits occur irrespective of soil reaction. The usual rate of application is 2 to 5 pounds per 1,000 square feet. Since hydrate is somewhat caustic, it is unwise to apply much more than 5 pounds per 1,000 square feet. Ordinarily 5 pounds is enough, but some oldtimers have used 10 pounds without serious discoloration. They apply the lime in late

afternoon and do not water until the following morning. Anybody using more than 5 pounds for the first time should start on a small area and wait one or two days before treating all the greens.

Sound Fertilizer Program

The dry clippings produced during a season on a green at Brynwood, which received ample phosphoric acid and potash together with $1\frac{1}{4}$ pounds of nitrogen per 1,000 square feet per month, was about 100 pounds per 1,000 square feet. The clippings contained 4.82 pounds of nitrogen, 1.73 pounds of phosphoric acid, and 3.79 pounds of potash. A 100-pound bag of 5-2-4 fertilizer contains an equivalent amount of plant food. This analysis is quite different from the 4-12-4, 5-10-5, etc., commonly used. They contain 5 to 6 times more phosphoric acid than the grass uses. A 1-1-1, or a 2-1-2 ratio would more nearly represent the plant nutrients removed by the grass.

Based on these figures, any sound fertilizer program must furnish during the season from 2 to 3 pounds phosphoric acid, 4 to 6 pounds potash per 1,000 square feet, along with enough nitrogen to keep the grass in active growth so it will resist clover and produce a turf which will help hold the ball. It takes 10 pounds of 20 per cent grade superphosphate to furnish 2 pounds of phosphoric acid, but where Milorganite is used six times a season at 20 pounds per month, it supplies 7 pounds total phosphoric acid, or four times what the grass removes. Some of the other natural organics furnish nearly as much phosphoric acid. The 6 pounds of potash is equivalent to 10 pounds of 60 per cent grade muriate of potash. A yearly application of 10 pounds superphosphate (20 per cent grade) and 10 pounds muriate of potash (60 per cent grade) provide enough of these elements. The phosphate and potash can be applied half in the spring and half in the fall, or they can be applied monthly at rates to furnish one-half pound phosphoric acid and one pound potash each time. Spring and fall are equally effective, and the easier method. Then feeding becomes a matter of nitrogen. Bent greens should get from 1 to $1\frac{1}{2}$ pounds of actual nitrogen per 1,000 square feet per month.

Stopping Iron Chlorosis

Iron chlorosis, or yellowing of the grass especially when the soil is too wet, seems to be on the increase. An excessive quantity of phosphate in the soil aggravates the condition. Lime in excess has the same effect. Samples from some greens tested in our laboratory have as much as 4,000 pounds of available phosphorus per acre, where 200 to 300 pounds is deemed ample. These greens are becoming low grade phosphate mines.

Prompt spraying with a little iron sulphate stops iron chlorosis. When chlorosis is severe, loss of grass is likely. Then the spots look like scald. Not more than half a pound of ferrous sulphate, commonly called "Copperas," should be used on the average green with not more than 20 to 50 gallons of water. Best results occur when the iron is absorbed directly into the leaves. Success depends upon spraying immediately when the yellow color appears with a minimum quantity of water. Do not water immediately afterwards. The low rate for copperas is necessary to avoid scorching the grass. In aggravated cases, repeat spraying may be necessary.

Crab grass seems to be more prevalent on greens than before the war—in other words, since Chlordane replaced lead arsenate for worm control. The phenyl mercury acetates have given good control of crab grass, especially of the narrow leaf kind. It is less effective on the large variety. Pre-emergence sprays seem to be in most favor with the phenyl mercury preparations. Little or no lead arsenate is being used now, and may be one reason for the greater amount of crab grass. It would be well to try lead arsenate this spring just before the time crab grass normally germinates in the locality. From 5 to 10 pounds should be used per 1,000 square feet. Some oldtimers still swear by this method of controlling crab grass. It is fairly cheap for weed control, and the single application is an added advantage in these days of labor shortage.

Bent greens should be cut close. High

cutting develops a matted condition and does not necessarily strengthen the grass. Only the green part of the plant is useful, brown portions cannot manufacture food and are a potential liability. A height of $\frac{1}{4}$ to $\frac{5}{16}$ inch is about right, because most of the better clubs cut at $\frac{1}{4}$ inch or less. It is wise to let the grass get well started in the spring before beginning to mow. This enables the leaves to make the additional food which the plant used to initiate growth. Frequent cutting is important to prevent mat formation. An undesirable mat is bound to develop from mowing two or three times a week, even if the mower is set to cut at $\frac{1}{4}$ inch or less. Many clubs skip mowing one day a week.

Some brushing on a regular schedule is desirable. It helps prevent the development of mat. Most mowers are equipped with brushes, or provision is made for attaching them. The use of a solid scalping roller in front of the reel is another way to encourage mat formation. They should be discarded.

Most courses use power greens mowers, although a few have gone back to hand mowing. Others are using hand mowers on low-lying greens that give trouble in hot weather. On many courses power greens mowers are operated at excessive speeds. This happened on fairways. Fast operating speeds tend to bruise the grass if the leaves are the least bit tender. Abrupt turning on the edge of the green also bruises the grass and soon develops bare ground. The apron should be of sufficient

ANNUAL TURF CONFERENCES

Jan. 11, 12—Annual Conference, Mid-Atlantic Association of Greenkeepers, Lord Baltimore Hotel, Baltimore, Md.

Jan. 22-26—20th Annual Rutgers One Week Turf Course, Rutgers Univ., New Brunswick, N. J.

JAN. 29-FEB. 2—22nd NATIONAL TURF CONFERENCE AND SHOW, SHERMAN HOTEL, CHICAGO, ILL.

Feb. 12-14—Texas Turf Conference, Texas Turf Association, College Station.

Feb. 26-Mar. 1—20th Annual Turf Conference, Pennsylvania State College, State College, Pa.

Mar. 5-8—Annual Turf Conference, Midwest Regional Turf Foundation, Purdue Univ., Lafayette, Ind.

Mar. 6, 7—Fourth Annual Turf Conference, Cornell University, Ithaca, N. Y.

Mar. 7, 8—Fourth Annual Turf Conference, State College of Washington, Pullman.

Mar. 8, 9—Annual Turf Conference (Concluding 10-Weeks Winter School), Univ. of Mass., Amherst.

Mar. 12-14—17th Annual Turf Conference, Iowa Greenkeepers Association, Iowa State College, Ames.

Mar. 7-9—Annual Turf Conference and Short Course, Minnesota Greenkeepers Association.

May 10-11—Southern Turf Conference, Tifton, Ga.

Oct. 24-26—Central Plains Turf Conference, Kansas State College.

width so the operator can swing around in a wide circle with the power clutch engaged. Otherwise the drive drum will bruise the grass when the clutch is engaged. Wilting grass should never be mowed with a power mower. The turf should be watered lightly first, and mowing delayed until the leaves recover from wilt. Some clubs mow in late afternoon during spells of hot, humid weather. They wait until there is no danger of wilt after cutting.

(To be concluded next month)

Take Equipment and Supply Deliveries Now or ?

Course equipment and supply dealers say present and prospective conditions emphasize the necessity of buying and taking deliveries on orders now. Ordering of machinery has been considerably heavier than usual at this time of the year but such supplies as chemicals, flags, poles, ball washers, cups, etc., still are about as usual for the period.

Dealers say clubs have become so dependent on dealers for immediate deliveries the clubs delay buying until the last minute. Under manufacturing and shipping conditions that may prevail in spring the slow-acting clubs may not get what they want when they want it.

Green Section Published A Classic; "Turf Management"

Turf Management, by H. Burton Musser. Published by McGraw-Hill Book Co., Inc., New York City, for USGA. 362 pages. Price \$6.

This comprehensive and practical manual of golf course turf work is not only an on-the-job working guide book and reference volume of great value for those responsible for golf course and other large turf area maintenance but is a landmark in scientific fine turf development.

The book brings together the tested and approved findings of the USGA Green Section, the nation's leading greenkeeping superintendents, the experts of agriculture experiment stations and of course material and equipment companies, and golf course architects. It is a project the USGA Green Section began two years ago with Fielding Wallace as USGA president, James D. Standish as USGA Green Section chairman and Fred V. Grau as Green Section Director. The editorial board consisted of Grau, Marshall E. Farnham, supt., Philadelphia (Pa.) CC and then pres., NGSA; O. J. Noer, agronomist of the Milwaukee Sewerage Commission; and Herb Graffis, editor, GOLFDOM.

Burt Musser, professor of agronomy, School of Agriculture, Pennsylvania State College, took his sabbatical year's leave to

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