
TIMELY TURF TOPICS

from the USGA Green Section

PREPARING A SOUTHERN GOLF COURSE FOR THE USGA AMATEUR

By J. E. HAMNER

GREENKEEPING SUPERINTENDENT, MEMPHIS COUNTRY CLUB

The 1948 USGA Amateur Championship was scheduled for the Memphis Country Club far enough in advance to allow about two years to prepare the golf course, which was somewhat run down due to war-time conditions. As this was the first time the Amateur was to be played in the South and the first time on Bermudagrass, we were eager to have an outstanding course.

The Chairman of the Green Committee, Mr. Hugh Francis, and I agreed that the first step in preparation for the Amateur should be formulation of a program of turf improvement and weed control. The tees, fairways and rough were infested with crabgrass, dallisgrass and other weeds.

On January 29, 1947, Dr. Fred V. Grau, director of the USGA Green Section, visited our club. After an inspection of the course and a general discussion of our problems, a program was outlined.

The weed control part of the program was carried out in the summer of 1947. Soil samples from the greens and fairways were sent to the Milwaukee Sewerage Commission and complete analyses were furnished us. Mr. O. J. Noer, agronomist of the Milwaukee Sewerage Commission, contributed much helpful advice to the success of the program.

Renovation of the Fairways

Beginning March 18, the F-G Aerifier equipped with the large (one-inch) spoons was set to penetrate the heavy clay soil to a depth of four inches. The Aerifier was then drawn over each swath twice. Ground limestone, at the rate of two tons per acre,

was applied immediately after the cultivation. After spreading the limestone, an old fairway mower was used effectively to break up the spooned-out particles of soil made by the Aerifier. Much of the limestone, which is slow in entering the soil, was placed in the root zone.

Milarsenite was used for the treatment of weeds in the fairways. The first application was started June 30. This is about the time of year when crabgrass seed heads begin to appear in this vicinity and is the ideal time to start treatment. Again, the Aerifier was put on the fairways set at a four-inch penetration. The fairways were watered to a depth of five or six inches, and when the grass blades were dry, Milarsenite at the rate of 400 pounds per acre was applied with a 10-foot Gandy Spreader. After about 72 hours, water again was put on the turf. An estimated 60 per cent of the crabgrass was killed in the first treatment.

The second application of Milarsenite began on July 15. Four hundred pounds to the acre was used in that treatment. The same procedure as in the first treatment was carried out.

On August 5 the third and final application of Milarsenite began. Because of rains, we were unable to complete the work until August 18. Milarsenite totalling 1,200 pounds to the acre was used in the three treatments. The crabgrass kill was nearly complete. Clover, wild barley, buckhorn and plantain were eradicated completely. Dallisgrass had to be removed with V-shaped garden hoes.

The Aerifier was put on the fairways September 15. Immediately after the cul-

tivation, an application of 1,000 pounds of Milorganite to the acre was made. The Milorganite greatly stimulated the Bermuda, and before the end of the growing season the fairways were covered almost completely with a healthy, vigorous turf.

The height of cut on the fairways at the beginning of the 1948 season was three-fourths of an inch. Later on, as the growth of the Bermuda increased, the mowers were lowered to five-eighths. The Aerifier was started about the first of April, used again in June and August, and a final cultivation was made just prior to the fall fertilization. Close cutting and the regular use of the Aerifier gave us a very tight, closely knit turf that offered perfect lies and really withstood the gaff during the Amateur. The several cultivations with the Aerifier made it possible for us to use much less water to maintain a healthy, vigorous fairway turf throughout the Bermuda season.

Rough

Arsenic acid was the chemical used to combat the weeds in the rough. One gallon of arsenic acid to 50 gallons of water to the acre was applied in each of the three treatments. A Friend Power Sprayer, equipped with a 14-foot boom using fan-shaped nozzles, gave splendid results. A pressure of about 50 pounds on the sprayer was used.

The first application of arsenic acid began June 17. The solution was sprayed on the rough at all times when the grass blades were dry. The killing effect of arsenic acid was much faster in its action on the weeds. Usually 24 hours after spraying most weeds were killed.

The second treatment started July 11 and the third August 2. The arsenic acid burned out 100 per cent of the weeds in the rough with the exception of dallisgrass. The dallisgrass was greatly retarded as most of its seed was destroyed. The Bermudagrass recovered very rapidly.

Tees

Arsenic acid was used also on the tees. Two treatments were sufficient to rid the tees of weeds. The first treatment was made June 20 and the second July 15.

The tees were thoroughly saturated with water. After the grass blades were dry, arsenic acid, at the same rate as was used on the rough, was sprayed on them. Two days later water was put on again. After each treatment the Aerifier was drawn over the tees, followed by a fertilization of 40 pounds of Milorganite to 1,000 square feet. The weed kill was similar to that in the rough. The Bermudagrass was very quick to spread over the thin areas.

Greens

The greens at our club are played about every day of the year. Domestic ryegrass is planted in the fall on one-half of the green for winter play. This method is used in order that we may have the Bermuda part of the green ready for play during, and for a short period after, the transition of rye to Bermuda, which usually occurs from June 1 to 15.

Twenty pounds of 20 per cent superphosphate to 1,000 square feet, put on the greens preceding the rye planting, seems to be ample to take care of the Bermuda requirement for the following year. Ground limestone, at the rate of 30 pounds to 1,000 square feet, was applied in the spring of 1947. Milorganite has been used exclusively for nitrogen feeding for the past two years.

When the Bermuda began to show the

CONFERENCE DATES

March

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| 1-4 | Cornell University Turf Conference, Ithaca, N. Y. John Cornman. |
| 7-9 | Purdue Turf Conference, Purdue University, West Lafayette, Ind. G. O. Mott. |
| 10-11-12 | Massachusetts State College Turf Conference, Amherst, Mass. Lawrence Dickinson. |
| 14-16 | Iowa Turf Conference, Iowa State College, Ames, Iowa. H. L. Lantz. |
| 17-18 | Minnesota Turf Conference, Minneapolis, Minn. A. W. Anderson, 3540 24th Street, South, Minneapolis, Minn. |

*first signs of growth in the spring, Milorganite was applied at the rate of 50 pounds to 1,000 square feet, and 25 pounds to 1,000 square feet thereafter once a month until about September 1. Our experience has been that the steady feeding of the organic nitrogen in Milorganite and the absence of burn to the turf appear to be the ideal source of that form of nitrogen for Bermudagrass.

Preceding the first application of Milorganite, the Aerifier was put on the greens with the one-inch spoons set to penetrate the soil to a depth of four inches. The spooned-out pieces of soil were removed with the Early Bird worm rakes. A topdressing, consisting of one-half coarse sand, one-fourth granulated peat and one-fourth woods soil, by volume, was worked into the greens with flexible steel mats. Very heavy topdressings were used to fill the large holes made by the Aerifier. During good Bermuda growth the holes covered completely in about ten days. This procedure was carried out once a month during the growing Bermuda season of 1947.

On parts of three of our greens there were heavy patches of crabgrass. On July 29, 1947, arsenic acid was sprayed on those greens at the rates that were used on the tees and the rough. One treatment destroyed the crabgrass. In two weeks time the Bermuda was as green as ever and had almost covered the places where the crabgrass had been. We would not hesitate to use arsenic acid for crabgrass on Bermuda greens. The results were perfectly satisfactory.

The Aerifier was put on the greens on three occasions during 1948, the first of May, the first week of July and the first week of August. Fertilization with Milorganite was the same as it had been in 1947. This year we used a flexible steel mat attached to the Aerifier in order to break up the soil particles. About one-half as much topdressing was needed by this operation on the greens. At times when the Aerifier was not put on the greens, light topdressings were made.

It is our belief that frequent light topdressings and close cutting are absolutely

necessary to maintain a good Bermuda putting surface.

The greens always are cut closely on our course. In the spring $\frac{1}{4}$ -inch is the regular height of cut. By the middle of May the mowers are lowered to $\frac{3}{16}$ -inch and are kept at that height for the remainder of the Bermuda season. The greens are mowed at a different angle each day. Even with the excellent texture of Bermuda which we have, it is necessary about twice a week during mid-summer to cut back and forth on the same swath. Using this method of cutting the greens, it is seldom necessary to put brushes on the mowers to eliminate grain in the turf.

With the continued use of the large spoons of the Aerifier and the topdressing formula mentioned, we have been able to change completely the upper physical structure of our greens. We have incorporated into the greens a granular mixture which has promoted aeration, deep-root penetration and resilience. The greens are holding the shots perfectly. We are using about one-half as much water now as we have in the past. The texture of the greens certainly has improved with less water.

We feel well repaid for our efforts by the many favorable comments made by the players and USGA officials on the condition of the course.

Turf's First Need

Excerpt from article on "Duties of the Greenkeeper" in South African Golf, August 20, 1948:

"If one general law of turf maintenance is desired, it might well be that turf needs first of all suitable conditions for growth rather than 'medicines' to correct the damage resulting from improper conditions. Generally speaking, a resort to 'doctoring' for the purpose of correcting damage caused by the numerous enemies of turf, such as weeds, insects, fungus, disease, etc., indicates the existence of negligence somewhere.

"It is better practice to remove the cause of the damage, and by adequate fertilizing, and by the use of soils that contain proper plant food, to enable the turf to withstand its enemies, than to resort to 'doctoring' after the damage is done."

HERSHEY'S "VERTICAL MOWER"



1. Front-side view, Jim Morrison up. Levers regulate depth.



2. Rear view, carrying wheels off the turf. Machine cuts six-foot swath.



3. Cut crabgrass runners picked up by hand before mowing. Discs cut inch deep.



4. Cutting fairways in two directions at right angles cuts turf into two-inch squares.



5. Fairway turf, cut twice, ready for conventional mowing to chop cut runners.



6. Same turf four or five days after mowing. Healing is complete in ten days.

Photos by Rands

Many years ago the fairways at Hershey Country Club, Hershey, Pa., were heavily infested with crabgrass. James Morrison, the superintendent, hit upon the idea of "vertical mowing." He spied an old culti-hoe in the corner of the implement shop, and one thing led to another. The hoes were removed and replaced with rolling plow coulters. The axles were remade to space the cutting discs four inches apart. The rear set was out of register so that the discs cut at 2-inch intervals.

A steel top with ends was made so that weight could be added.

For two seasons he used the machine frequently, cutting the fairways in two directions before mowing. The crabgrass disappeared.

The machine is used also in reseeding and fertilizing. In reseeding, the machine is operated in two directions. Seed is sowed with a wheelbarrow seeder, and the sprinkling system is turned on for one to two hours to wash the seed into the crevices.

AMERICAN SOCIETY OF AGRONOMY 1948 TURF COMMITTEE REPORT

CONDENSED FROM THE JOURNAL, AMERICAN SOCIETY OF AGRONOMY,
VOL. 40, No. 12, DECEMBER, 1948, P. 1140

The report of the 1947 Turf Committee presented these figures in the *Journal, American Society of Agronomy*, Volume 39, No. 12:

Turf sports fields.....	More than 18,000
Total estimated replacement value	\$305,000,000
Grassed areas in parks.....	250,000 acres
Turfed areas on golf courses.....	272,133 acres
Total estimated value.....	\$1,000,000,000
Lawns—Number of lawns...	15,000,000
Estimated average size...	3,000 sq. ft.
Estimated replacement value	\$750,000,000
Airfields—total number.....	4,490
Total acreage	1,709,632

The report of the 1948 Turf Committee shows that there are 500,000 acres in cemeteries, half of which has been developed.

Acreage in airfields increased 131,280 acres to a total of 1,840,912 acres. About 98 per cent of the increase was in small civilian fields of 40 to 160 acres.

In 1947, 141 new golf courses were built, 102 of which were nine-hole courses. In 1948, 86 new courses were built to July 1, 62 of which were nine-hole courses. Much of the increase has been at military posts.

Highland bent is recommended by the committee as a satisfactory substitute for redtop in turf seed mixtures. Redtop is scarce and is high in price.

Domestic ryegrass (a mixture of annual and perennial types) is recommended for elimination from mixtures containing perennial turf species. Perennial ryegrass is more satisfactory, but it is difficult to cut with ordinary home lawnmowers.

Timothy is not recommended as a substitute for redtop in general lawn mixtures.

The committee recommended expansion of education on lower seeding rates, better soil and seedbed preparation, adequate fertility and timely seeding to reduce the impact of high seed prices.

Alta fescue and Kentucky 31 fescue are considered to be worthy of more serious consideration and study as ingredients of

seed mixtures for parks, cemeteries, roadsides, fairways, and similar turf.

More basic research is needed on grass species which are valuable both for agriculture and for turf purposes.

This incomplete list of suggested lines of research is offered for guidance of research organizations:

1. Mechanical aeration of soils under continuous turf cover.
2. Rapid economical vegetative planting into existing turf.
3. Evaluation of common management practices in relation to recovery of turf from traffic injury.
4. Evaluation of turf species adapted to low soil fertility.
5. Moisture requirements of turf types.
6. Classification of turf grasses for various uses.
7. Heat and fire tolerance of turf grasses.
8. A classification of the service requirements of turf in various categories.
9. Studies of root systems of turf.
10. Evaluation of turf species adapted to arid conditions.

FRED V. GRAU, CHAIRMAN

Other members of the committee were: K. L. Anderson, G. W. Burton, E. B. Cale, M. E. Farnham, C. K. Hallowell, G. H. Jones, W. V. Kell, R. H. Morrish, G. O. Mott, H. B. Musser, O. J. Noer, A. E. Rabbitt, C. R. Runyan, H. A. Schoth, H. B. Sprague.

We urge all who are interested in crops, soils and turf to become affiliated with the American Society of Agronomy.

Membership in the Society is \$7.50 a year. Applications should be sent to Dr. G. G. Pohlman, Department of Agronomy, Agricultural Experiment Station, Morgantown, W. Va.

SUBSCRIBERS TO GREEN SECTION SERVICE IN 1948

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Greenkeepers' Club of Western Pennsylvania (The), Irwin, Pa.
Greenkeeping Superintendents' Association (The), St. Charles, Ill.
Mid-Atlantic Association of Greenkeepers, Washington, D. C.

Bowling Clubs

Kaituna Bowling Club, Dunedin, New Zealand

Cemeteries

Cave Hill Cemetery Co., Inc., Louisville, Ky.
Gate of Heaven Cemetery, Loveland, Ohio
Ridge Hill Memorial Park, Lorain, Ohio
Rosehill Cemetery Co., Chicago, Ill.
Spring Grove, Cemetery of, Cincinnati, Ohio
Vine Street Hill Cemetery Association (The), Cincinnati, Ohio
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Bartlett, F. A., Tree Expert Co. (The), Bala-Cynwyd, Pa.
Bean, John, Mfg. Co., Lansing, Mich.
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Clapper Co. (The), West Newton, Mass.
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Connolly, J. S., Bethesda, Md.
Cooperative Seed & Fertilizer Supply Service, Inc., Richmond, Va.
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Davis, George A., Inc., Chicago, Ill.
Davison Chemical Corp. (The), Baltimore, Md.
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Drumcliff Co. (The), Towson, Md.
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DuPont Semesan Co., Wilmington, Del.
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Everett Seed Co., Atlanta, Ga.
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Gandrud, E. S., Co., Owatonna, Minn.
Geary Bros., Klamath Falls, Ore.
Germain Seed & Plant Co., Los Angeles, Cal.
Godwin, Hiram F., Detroit, Mich.
Golf & Lawn Supply Corp., White Plains, N. Y.
Greiner, Clarence E., Co., Indianapolis, Ind.
Griffith, E. H., Pittsburgh, Pa.
Harradine, Donald, Magliaso-Lugano, Switzerland
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Kylander Co. (The), Hartford, Conn.
Lapp, Walter S., Lansdale, Pa.
Lawn & Golf Supply Co., Philadelphia, Pa.
Lanck, O. E., Co., Inc., Clifton, N. J.

Mallinckrodt Chemical Works, New York
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McCullough, J. Chas., Seed Co. (The), Cincinnati, Ohio
Merek & Co., Inc., Rahway, N. J.
Michigan Peat, Inc., New York, N. Y.
Minnesota Millorganite Co., Long Lake, Minn.
Niagara Sprayer & Chemical Division, Middleport, N. Y.
*Northrup, King & Co., Berkeley, Cal.
Ohio Toro Co., Cleveland, Ohio
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Whitney Seed Co., Inc., Buffalo, N. Y.
Wood, T. W., & Sons, Richmond, Va.
†Woodruff, F. H., & Sons, Inc., Milford, Conn.
Woodside Bent Grass Nurseries, Des Moines
Worthington Ball Co. (The), Elyria, Ohio
Worthington Mower Co., Stroudsburg, Pa.

Golf Clubs Not Eligible for USGA

Marlborough Golf & Country Club, Ltd., Cartierville, P. Q., Canada
Marine Drive Golf Club, Vancouver, B. C.
Sunningdale Golf Club, London, Ont., Canada

Golf Course Architects

Diddel & Johnson, Ormond Beach, Fla.
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Harris, Robert Bruce, Chicago, Ill.
Jones, Robert Trent, New York, N. Y.
Lawrence, Robert F., Boca Raton, Fla.
Maxwell, Perry, Tulsa, Okla.
McGovern, J. B., Wynnewood, Pa.
Raynor, Ralph I., Melrose Park, Pa.
Thompson, Stanley & Associates, Toronto.

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Ladd, Greeley, Minneapolis, Minn.

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Forest Preserve, District of Cook County, Chicago, Ill.
Minneapolis, City of, Minneapolis, Minn.
San Francisco, City and County of, Cal.
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DuPont, H. F., Winterthur, Del.

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Georgetown Preparatory School, Garrett Park, Md.

* Placed two \$30 subscriptions.

† Placed four \$30 subscriptions.