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aids the bacterial activity by allowing oxygen to circulate.

By a countless number of tests with the watermelon knife and the triangular plug I have observed that the entire area around the Aerifier hole was moist to the full depth of penetration after a rain or thorough artificial watering. With such encouragement we set up an aerification program with one Aerifier three years ago. That has begun to pay off in a definite reduction of thatch. One aerification? No. After fourteen aerifications during this three year period, followed by lime at one ton per acre on two different occasions, and rather liberal amounts of fertilizer in spring and early fall, we are observing such progress that we recently purchased the triplex set of Aerifiers to cover our twenty-seven holes with a more efficient program.

Inspecting turf at Seaview — Warren Bidwell, Supt. Seaview CC (L) and Ed Stieniger, Supt. Pine Valley GC (R).

Plant Food Gets Through

Subsequent examinations after the program was in operation showed ample evidence that moisture and plant food were getting into the numerous Aerifier holes and passing through the thatch into the area where bacterial activity is greatest. Thus, a noticeable reduction of thatch was not surprising, for three of Nature's most important requirements, moisture, available food and oxygen, were being supplied to the bacteria through the aid of the Aerifier.

The plow which has been standing by, just in case, will continue to gather rust except for occasional use in preparing our soil bed or nursery.

Sound Northern Practice Is Successful Basis in South

By TED BOOTERBAUGH

Supt., Lakewood Golf Club course, Point Clear, Ala.

(GCSA convention paper)

The improvement which we have been able to make on the turf at Lakewood Golf course at Point Clear, Ala., has been accomplished by the strict application of the practices and theories which we all have learned at these turf conferences. These practices and theories all lead to one major objective, which is to develop a deep healthy root system on greens, tees and fairways.

The big problem before the golf course superintendent today is how to develop a deep root system and hold it. I believe we can learn a good lesson from nature by observing the frost action on soil. This repeated freezing and thawing of soil in the spring of the year is the best conditioner we have in preparing the soil for deep root penetration. We have all seen good healthy root penetration on northern greens in the spring, but when we start rolling and skinning our greens at 3/16 in. seven days a week, and with the added impact of rains, spray from sprinklers and the ever increasing compaction by golfers, we end up with a shallow, sickly root system during the hot months when we really need deep roots.

I believe the conclusion we should draw from this observation is that the best time to aerify is during the hot humid months. I also believe that greens should be cut ¼ in. during the trouble months, and if your root system becomes shallow, cut your greens five times per week instead of seven. Our members will tolerate a slow healthy green a lot better than they will a sick fast one.

Having observed the beneficial results from the repeated freezing and thawing action on turf in the north, I took this lesson with me to Lakewood, and started an aerifying program second to none. I will bet you that we have the "holiest" course in the country. I think O. J. Noer, Charles Hallowell and Tom Mascaro will verify this.

The following program has given satisfactory results at Lakewood on sandy soil.

GREENS: Cut at ¼ in. to 3/16 in. seven days per week. We skip cutting when possible. We fertilize every two weeks with light applications, followed within three days by a combination spray for disease and insect control. We change cups three times per week. We plug out weeds when they appear. Water as needed. Aerify and topdress Bermuda greens, once per month, rye greens as needed.

TEES: Cut three times per week at 5/16 in. Fertilize once per month with

heavy application of fertilizer. Aerify and topdress three times per year. Change tee plates and towels and service ball washers three times per week. Treat for weeds when necessary. Repair divots weekly.

FAIRWAYS: Cut three times per week at ¾ in. Fertilize three times per year with 500 lbs. Milorganite per acre. Aerify four times per year. Spray for weeds two times per year; spring and fall.

ROUGH: Cut once per week. Spray once per year for weeds.

We seed our winter greens September 15th with five lbs. ryegrass per 1,000 sq. ft. after double spiking. No topdressing. Two weeks later we double aerify, seed with 15 lbs. of ryegrass per 1,000 sq. ft. and top-dress at medium rate. We do not use temporary greens during this seeding operation, and do not change height of cut on greens. We do not rake Bermuda before seeding. Fairways and tees are seeded with about 150 lbs. rye per acre.

We have 14 men on the golf course. They are used in this maner:

1—Full time mechanic.
1—Full time sand trap man.
1—Full time club house grounds man.
2—Full time watering men.
1—Full time fairway mower man.
1—Full time tee cutting and maintenance man.

The remainder of men cut greens, trim around greens, traps, trees, etc., police grounds, fertilize, aerify, topdress, spray greens, etc.

We pay our men 75 to 80 cents per hour.

Our budget runs about $5000 a month the year around, but there's considerable construction work included in this figure. We've also had quite a job in getting the course in excellent condition as there has been much chemical elimination of undesirable grasses and weeds we've had to do.

The management of the course insists on having the best possible golf turf for players and if you've talked to anyone who has played our course I'm confident that you have learned that the maintenance policy and practices at Lakewood have been good sound business.

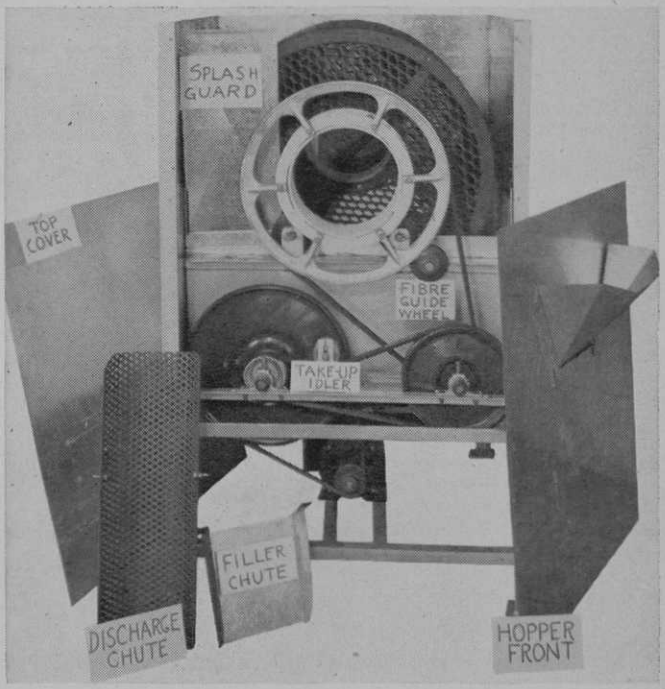
TECHNICAL STUDY OF TURF

(Continued from page 37)

age bent so it will be there in the hot, dry summer when poa annua goes out. "Red" Lambert told of experiments in trying to keep fertilizer near the surface so the shallow-rooted poa annua might survive the summer. Art Twombly shared in the opinion that in many places where drastic measures for poa annua elimination couldn't be taken the practical thing to do is to seek a way to keep it.

The research team began its testimony

"CHALINKO" GOLF BALL WASHER



Balls are dumped into hopper or over trough into revolving cylinder drum which has opposed baffles. *This entire inner unit is heavily coated with pure rubber,* no brushes, no riffles to scrub paint off or injure balls. Same principle as used by modern laundries all over the world.

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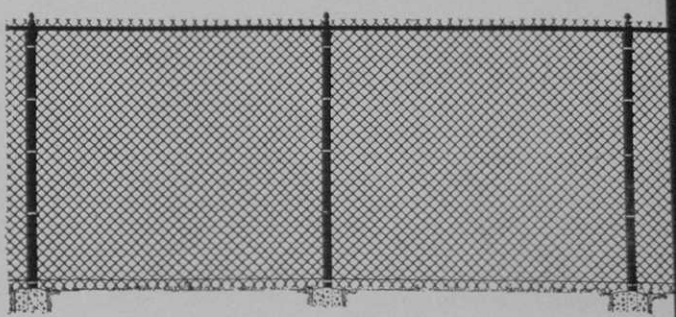

with Grau reminding that poa annua kept surviving because of conditions favorable to it. Burt Musser gave supts. and chairmen an impressive idea of what attempts had been made to solve the poa annua problem and how the available data has been collected and coordinated, in presenting a list of 93 articles on the subject. They are divided into four categories: characteristics of poa annua; turf quality of poa annua and methods of holding it; methods of controlling it; and study of the losses of poa annua which may include losses by diseases that haven't been recognized.

Musser commented that there has been very little experimental work done by the scientists to back up practical experience.

Ralph Engel outlined the job of getting something that might do to poa annua what 2,4-D does to broad-leaved weeds without injury to plants to be retained. Maybe something will come from work at Rhode Island and at Purdue in discovering a selective treatment for poa annua, Engel said. He spoke of destroying the seed while it is resting in the soil and mentioned numerous factors of plant nature, weather, soil, time of control application and soil nutrients that figure in the poa annua problem.

Engel and Jesse De France both pointed out that any grass that can survive as poa annua does is remarkable and warrants study to see if it may be maintained as useful golf turf.

Before much that has satisfactory scientific basis can be done in answering the poa annua problem De France said at least three years of closely coordinated work by scientists and superintendents is necessary. He remarked that golf course research is not possible without the daily supervision that is practically beyond hope.

De France named chemicals that are being considered for preventing poa annua seed production and destroying the life cycle of the plant. He said that the behavior of poa annua is unpredictable under some conditions.

Alex Radko referred to the possibility of developing a program of using poa annua as a companion grass to a warm season grass.

Robinson and Daniel reported on research to crowd out poa annua by nitrogen and other treatments. Daniel believed that the answer might be found in soil conditions or in learning why poa annua won't come back after wilting as bluegrass does. Daniel also told of observing curious features of poa annua; some with "stolons" 6 in. long and not a leaf; and some apparently dead seed heads that hadn't shown signs of life for 27 months springing out with live shoots. He is hopeful that an Indianapolis Golf Assn. and Indiana supts. fellowship at Midwest Turf Foundation will come up with considerable advance toward the poa annua answer.

Problem Differs

Lively discussion followed the testimony. It was brought out that the poa annua problem differs in different parts of the country, and that watering practice may have quite a little to do with the spread of poa annua. Possibility of IPC as poa annua control was favorably mentioned. Some reported they had seeded before last sodium arsenite treatment has been applied and while germination might have been delayed a bit it wasn't inhibited and on the over-all picture of work, time was saved.

One comment was that as long as members demand a lot of watering there'll be poa annua.

The session concluded with a movie on Krillium for soil conditioning, with Dr. Wm. P. Martin of the Ohio State University and Ohio Experiment Station commenting as the film showing the Monsanto Chemical Co. "synthetic substitute for natural humus" was presented.

Leonard Strong, supt., Saucon Valley CC, Bethlehem, Pa., presided over the Thursday morning session with Dr. Virgil Overholt, Ext. Agri. Engineer, Ohio State University, leading off with a prepared paper on the subject of "Soil Structure and Drainage," which will appear in a forthcoming issue of Golfdom.

Soil Testing Valuable Tool

An interesting discussion on "Tests for Showing Plant Food Deficiency," was presented by O. J. Noer and Dr. Wm. H. Daniel, Agronomy Dept., Purdue University. Noer pointed out soil testing is a valuable tool — one which the superintendent should use and not let the soil test him. Reliable tests show the plant foods in the soil as well as the necessary requirements for lime. He cautioned tests were no better than the samples taken. A study made of soil samples taken at different depths resulted in adopting a standard practice of taking samples of two inch depth for satisfactory testing.

Dr. Daniels made the observation the greatest proof of the value of soil testing are the various laboratories set up in almost every state under uniform procedure.

After showing results of a study made of 14 soil plugs and a practical demonstration of tissue testing he announced small plant tissue testing kits for practical use in meeting individual course conditions will be available soon and refills for those already having kits will be available also.

Bill Beresford outlined the "Fairway

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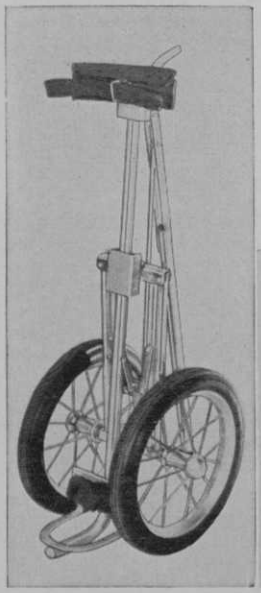

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Maintenance Program at Los Angeles CC," carried on over a period of 10 years which includes a battle to overcome an infestation of Dallas grass brought in with fertilizer used at the beginning of the program. Diesel fuel was found to be the only thing effective in control of the grass and a program which started with the use of 1500 gals. per week is now down to 800 gals per season. He reported he had effectively overcome the problem of crab grass with the use of sodium arsenite with no trouble in the greens and a turf second to none in the L. A. district.

Prepared papers on the "Control of Chickweed and Clover in Fairways," by Prof. H. B. Musser, Penn State and "National Coordinated Crabgrass Results," by Alex M. Radko, USGA Green Section, completed the morning session. These papers will appear in an early issue of Golfdom.

Final session of the educational conference, Thursday afternoon, had John Price, Supt., Southern Hills CC, Tulsa, Okla., as presiding officer. The first paper presented was that of Taylor Boyd, Supt., Camargo Club, Cincinnati, Ohio, on the subject of "Records and Labor Management." Complete text is found on page 50 of this issue.

The important topic of "Superintendent's Relations," was ably outlined by Frank P. Dunlap, Country Club of Cleve-

land. He impressed on his fellow superintendents the need for recognizing importance of good public relations and using time proven methods to improve the individual and collective standing of those in the course maintenance profession. Although duties of superintendent include a more varied assortment of skills than any other group he cannot afford to neglect the product he has to sell — himself.

Salesmanship Needed

Dunlap stressed good salesmanship as prime asset of the superintendent and pointed out steps to take in meeting this need, some of which included: interest in club activities, taking active part in community functions, personal interest in members, letter writing, reporting ideas learned at conventions and short courses, making suggestions and proposals, and above all, pride in personal appearance — look the part of a successful superintendent.

A panel discussion on the subject of "Short Cutting vs. Long Cutting" made an interesting finale to a fine educational program. The team of Fred Grau, Ralph Engel and Robert Henderson, supt., CC of Buffalo, N. Y. presented arguments in support of short cutting while Wm. H. Daniel, Dr. J. A. DeFrance and Clarence Wolfrom, supt., Maple Lane GC, Warren, Mich., took the affirmative for long cutting.

Grau, in introducing the subject stated all courses are not expected to meet the same high standards the USGA sets for its championships. For purposes of the discussion ¾ in. was arbitrary figure used to differentiate between long and short cut. Colored slides were used to illustrate advantages of short cut and turf at Southern Hills CC, Tulsa, Okla., and Saucon Valley CC, among others, were cited as outstanding examples showing advantages of desired playing turf where no complaints were voiced.

Short Cutting Favored

Bob Henderson starting with bluegrass cut at one inch changed to Colonial bent in fairways cut a 7/16 in. to satisfy demands of professionals in his area and members of his club. A canvass of professionals around Buffalo brought out reasons why short cutting was favored. They include: better control of shot, keeps ball up, no need to take divots, speeds play, better stance and affords more different kinds of shots.

Engel in reviewing studies made on Kentucky bluegrass, fescues and bent grass for the New Jersey area gave reasons why bent grass won by large majority over other two grasses. Some of those reasons: bent comes in naturally in fairways, likes water with limitations, basic requirement of maintenance is close cutting, closer mowing lowers maintenance cost, sponginess and matting de-

velop if not cut close depriving golfers of desired fairways.

Summing up Grau pointed out firmness and denseness of turf is not only desired but essential to good golf shots and close cutting if not eliminating clover makes it less objectionable.

Daniel in his opening remarks on long cutting acknowledged more superintendents were cutting close than high but consideration must be given to height of cut suitable to species of grass grown, that perhaps long cut may be needed on muny or fee courses for low maintenance costs and to avoid necessary expense of changing to grass suitable for short cut.

Wolfrom reiterated points made by Daniel emphasizing poorer clubs do better with turf maintenance at higher cuts, that studies by Mich. State College proved benefits obtained from high cutting and test plots at Selfridge Field proved turf easier to maintain at higher cut.

Listing eight points in favor of long cutting prepared with cooperation of two good turf men DeFrance prefaced his remarks by stating experience advocates close cutting in the New England area.

SHAWNEE TO HOST LEFT-HANDERS

The 13th Annual Tournament of the National Assoc. of Left-Handed Golfers will be played at the Shawnee-on-Delaware golf course, Aug. 4-7, announces Robert Romberger, their executive secy.

Keep Poa Annua Cool To Hold It

By LAWRENCE HUBER
Supt., Ohio State University Courses

(GCSA Paper)

We all know poa annua is a cool weather grass. On the two courses I have been with, in the early part of my observations, we were fortunate in having deep well water that had a temperature of 55 degrees. Our pump capacity was just about enough to hold the pressure required to water all of our greens and fairways but to hold the pressure it was necessary to keep it running so that this cold water was being used instantly on the grass. I suppose the temperature would go up some through the pipe lines but not too much, since we watered at night.

I noticed that by using this cold water at these two courses that poa annua was not too much of a problem even in hot summer weather. Naturally we would lose some of it, due to sudden thunderstorms causing water to stand in puddles and then the hot sun coming out, and scalding it. But it usually comes back at the beginning of cooler weather.

On the Ohio State University's courses the drainage was installed, I would say, perfectly, but with the trees getting larger each year and having quite a few