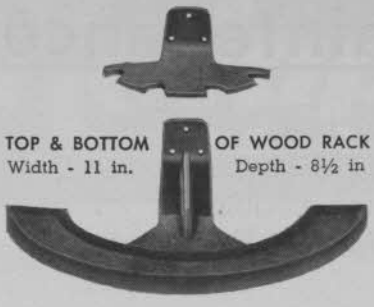

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Pros bought over 1,200 Wittek Space-Saver Displays at Dunedin this winter.

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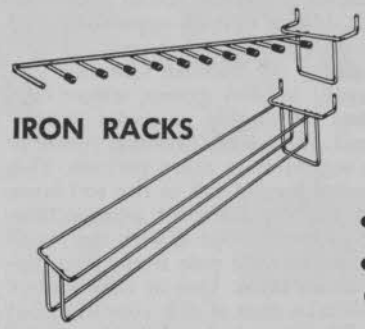

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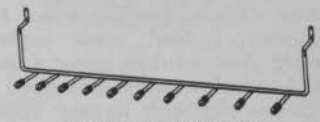

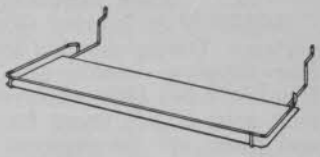

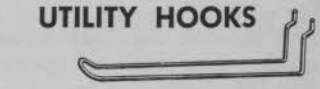

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New Course Maintenance

An Architect Looks at—

- Mowing Practices
- Moisture Problems
- Fertilization Programs

By Geoffrey S. Cornish
Golf Course Architect, Amherst, Mass.

IN WORKING with several supts. who have brought recently constructed courses into play, I have become increasingly aware of several recurring problems unlike those encountered in maintenance of established turf. For those who are operating new courses, individual holes or greens, it might be helpful to outline methods others have used successfully in meeting a few of these problems.

It is fundamental that the sooner regular mowing with a greenmower starts, the sooner the grass will form a putting turf. Allowing new bent to grow tall results in a matted condition as does continued cutting with a machine other than a greenmower. Indeed, some supts. have been most successful in using a greenmower at the initial mowing of seeded or stolonized greens although it may appear that it is actually damaging the grass at the time.

Mow Regularly

Regularity in mowing is of utmost importance. During growing seasons at least four clippings weekly are necessary. It frequently has been observed that if the new grass is left uncut for several days and then cut, development of the new grass is seriously retarded. This is probably why new greens opened early for play and mowed regularly sometimes fill in quicker than those not opened and mowed less frequently.

It is my observation that the superb new Penncross, if not maintained at a low height of cut in initial stages, takes on an entirely different and inferior character at maturity despite subsequent care. Some of the reported "fluffing" of Penncross is perhaps due to infrequent mowing in post-seedling stages.

Exception to Close Mowing

Despite the greatest of care in mowing and in other ways, we sometimes see one or more stubborn greens that do not seem to form turf. Some probable causes of this on stolonized greens are: (1) the stolons were not fresh when planted; (2) old nursery stock was used; and (3) the green was planted late in the season after growth was finished. When this poor turf condition results often it can be remedied by merely raising the height of cut about ⅛ in. John Cornman recommended this for a course in New York State after other practices had failed. Results were astonishing. I have since seen this simple expedient work wonders on other stubborn greens. This remedy was, however, only expedient after the green had failed to respond to the close mowing recommended above. In other words, higher cutting apparently had to be preceeded by close mowing.

Sogginess on Sodded Greens

On recently sodded greens where topsoil has been thoroughly prepared in relation to sand admixture, we may observe dangerous sogginess in rainy periods. This may be caused by the soil in the sod layer being of a slightly different texture than that of the prepared topsoil with the result that moisture does not pass freely from the sod to the lower layer. One or two winters of frost will take care of this condition but since it is dangerous in hot humid weather it should be relieved by aeration. Three or four aerifications, spaced about a week apart, should relieve the condition, but during this period syringing with water is of importance to save the sod. Several supts. have reported that wetting agents will also reduce sogginess.

Sogginess may be aggravated by the presence of trees that shade the green or cut off circulation. Then a choice has to be made between trees or the grass. On new courses it is best to remove the trees before putting the layouts in play due to member resistance to tree removal.

(Continued on page 147)

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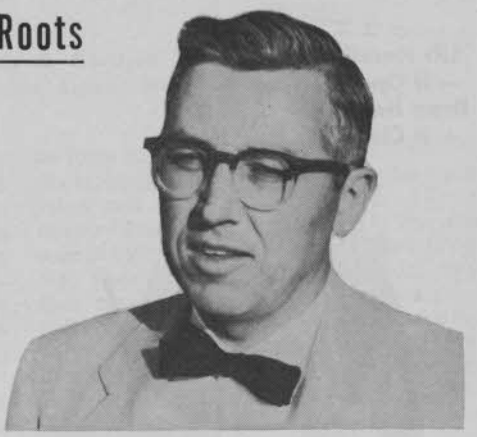
and Carry Nutrients to Plant Roots

Robert A. Moore*
Pres., Aquatrols Corp. of America, Camden, N. J.



CORRECT or incorrect use of water can mean life or death to turf. For centuries people have dealt with water as if it were sacred — as if nothing could be done to change it. Yet, in 1959, a number of supts. in areas with adverse weather conditions produced turf that responded differently. Their turf was denser, more disease resistant, better rooted. It was turf that was tougher in relation to wear, temperature, humidity, and wilt. It was produced from freely moving, more available water and nutrients — grown consistantly under low soil-moisture-tensions.

We have seen many slides and charts with response curves. These should, and someday will, show at least two sets of response curves — one for normal moisture tensions; the other for low moisture-tensions.

These tensions can be changed — and when changed, the turf produced responds differently. Clearly two factors stand out as fundamental in growing superior turf:

1) the rate at which water displaces itself in a soil;
2) the availability and rate of utilization of water and nutrients as evaluated in terms of soil-moisture tensions.

With any soil condition and moisture content, what has to be proved is that a plant's physiology is affected by the soil-moisture tension of its environment. Tension of this environment is directly affected by non-ionic wetting-agents.

Most of us are familiar with the mechanical aspect of non-ionic wetting-agents where the reduction in tension of water allows water to penetrate more readily into problem areas such as hard spots, thatch, localized dry spots, banks, etc. Here, we can easily get lost in a tangle of dissension as to what the problem is and how it should be solved. Should we change our fertilizer program? aerify? aerify and apply soil-wetting-agents? should we renovate? try new grasses? is the problem one of soil composition?

Dr. D. B. Peters, at the USDA experiment station in Urbana, Ill., studied the effects of soil-moisture-tension. His findings showed that soil-moisture-tensions control:

1) movement of water and nutrients in soil;
2) the uptake of water and nutrients by the plant;
3) that nutrient starvation set in under high tension conditions before water starvation (or wilt.)

Thus a plant's growth can be determined by the tension of the soil moisture in which it lives. Before, it was shown that these tensions can be controlled by non-ionic wetting-agents.

Nursery Stock Greatly Improved

Let's turn to the ornamental nursery field where a great deal of information is now available and more will be pub-

**This is a condensation of a speech that Moore gave at the recent annual conference of the Mid-Atlantic GCSA.*

lished this year. What happens to nursery stock grown under low soil-moisture-tensions? One big advantage in the nursery field is that a person is able to take plant material and follow its development over a period of months or years. Plants grown consistently under low-moisture-tensions make better growth, are denser, more disease wilt resistant and develop better root systems.

You can take the best prepared soil, physically change its moisture, and you will get a result that is utterly new. These same results are being obtained by the few supts. who have maintained their turf under low-moisture-tensions.

These results raise such questions as: What does constitute a proper soil mixture for a green? What is the most effective fertilizer program? What grasses are most desirable? To each question we can point to case after case where changing the physical characteristics of water gives us a new insight into our use of this basic ingredient of life itself. This requires a new look at all the good maintenance practices that have been developed over the years — a reevaluation of them in terms of low-moisture-tensions.

Program Must Be Followed

It can truthfully be said that this is a new philosophy of growing plant material. That is under low soil-moisture-tensions. But these results do not happen overnight! A program must be followed. A blend of non-ionic wetting agents should be used according to this general plan:

1) Every year apply a total of 24 to 32 ozs. of non-ionic wetting agent per 1,000 sq. ft. Each application should be at the rate of 8 ozs. per 1,000 sq. ft.
2. Under severe conditions apply 8 ozs. per 1,000 sq. ft. at monthly intervals during the season.
3) To promote deeper rooting, make both an early spring and fall application.
4) For maximum performance keep your program on schedule.

These rates of application are based on using a blend of non-ionic wetting agents that is 100 per cent active ingredients. Your average yearly cost for such a program should be in the neighborhood of $2.00 to $3.00 per 1,000 sq. ft. In terms of all greens, collars, approaches and tees on an average 18 hole course, the cost would be less than $450 a year.

What can be expected from following such a program? After consistenely growing under low-moisture-tension conditions, supts. have essentially eliminated syringing. They report very little evidence of wilt. Their fungicidal program and control are more effective. Their turf is denser, more resistant to wear and deeper rooted. During 1959 they had had more play than ever before and their greens were better than ever.

Our thinking shouldn't be confined to past experiences where soil wetting agents were used sparingly. This is not a one shot proposition — it is a program.

Royal Canadian Association Releases Annual Report

The pres. and board of governors of the Royal Canadian Golf Assn., released its annual report late in February. The assn., in its 64th year, pointed out that the highlights of 1959 were development of a Junior program and introduction of two major competitions for youngsters, Canadian Junior Match Play championship and the Junior Interprovincial team matches. RCGA, the report said, will continue to abide by the Royal & Ancient rules on lost ball, ball out of bounds and unplayable lie in 1960 and not follow the lead of the USGA in reducing the penalty on these.

In 1959, the RCGA's excess of revenue over expenses was $5,600, with a total revenue increase of $3,800. Surplus account of the organization was increased to nearly $30,000.

Receipts from the 1959 National Golf Week were $11,771 and it took $3,841 to promote the event. Net receipts were distributed to eight provincial associations.

The 1960 pres. of the RCGA is V. C. Holdroyd of Toronto. H. C. Lyle of Vancouver and Dr. J. E. Leddy of Saskatoon are vps and C. E. Robinson of Toronto is secy.-treas.

Southern California Costs

Southern Calif. GA's cost analysis committee recently published a survey of golf course maintenance costs at member clubs for 1958 and the following information was revealed: Of 25 clubs reporting, four said their course maintenance costs exceeded $100,000 a year; four were in the $90,000 to $100,000 bracket; three were in the $80,000 to $90,000 bracket; seven clubs put their expenses at between $70,000 and $80,000; two had them pegged between $60,000 and $70,000; and five were under $60,000. The average for the 25 clubs figures out to $80,000.

GRAU'S ANSWERS TO TURF QUESTIONS

If you have questions about turf care, please send them to Fred Grau (right) c/o Golfdom.

GCSA Hopes to Do Something About Built-in Headaches

The struggle to achieve golf courses with "built-in maintenance" has a new champion — newly-elected GCSA pres., James E. Thomas of Army Navy CC, Arlington, Va. There is nothing "new" about Jim's interest in the problem of avoiding built-in courses headaches. He has been correcting them for years. In his new position he plans to give full support to the 1600 GCSA members in their campaign to spell out in 1-2-3 order the most serious built-in headaches, and to outline the way in which planners, architects and builders can best work together to avoid them.

It has been said that there is an element of selfishness in the campaign to create golf courses that will be easier to maintain. Admitting that this is true, the next question is, "Isn't it about time?"

Work Around the Clock

When the weather is tough and the going gets rough, supts. often work around the clock, seven days a week, to maintain good playing conditions. When a supt. is fighting built-in headaches, a slight slip in vigilance (a man needs **some** sleep) against disease, flooding or stagnation easily can mean the loss of great areas of turf. A sudden disastrous turn of the weather can nullify weeks and months of careful preparation even without any slips. Too often this means an unjustified loss of job when officials do not understand the true situation. Anything, then, that will help to achieve simplified routine maintenance is worthwhile.

Golfers Benefit

The real beneficiaries of simplified maintenance resulting from improved design and construction are not the supts. but the golfers! There have been numerous long, loud squawks from players, "Why does the crew always have to be messing around on the course when we're playing golf?" The answer is simple: To try to keep the course playable. Properly-built courses do not need constant wet nursing to keep them in top playing condition. Routine maintenance can be accomplished when there is little or no play on the course. By contrast, only by constant attention can poorly built areas be kept playable.

Handbook Suggested

In preparing for the Houston program on "Construction Concepts of a Golf Course" letters were written to architects, builders, supts. and technical workers asking for their viewpoints. The replies poured in, all eager to expose the weaknesses of hard-to-keep courses. Each one supported the basic concepts of good construction as George Cobb, Warren Bidwell and Charlie Danner so clearly set forth in their papers at the GCSA convention. One of the suggestions has exceptional merit and it may become a reality — to prepare a guide or handbook designed to help create virtually trouble free courses.

One of the oft-repeated suggestions was to hire a qualified supt. as soon as the decision is made that a new course is to be built. Give him authority and the responsibility of protecting the interests of the club by demanding built-in maintenance that gives maximum playability even under the most adverse conditions.

Harry Burkhardt on Winter Play

Gentlemen:

In the February issue of Golfdom, I was much interested in my old friend, Fred Grau's remarks on winter play damage.

We have played 2300 rounds of golf at Shawnee Hills and almost 3000 at No. 1 course at Rocky River in December and January. We have had very little damage even on the new greens at Shawnee Hills.

Winter golfers seem to have much more respect for a golf course than summer golfers.

We close the tees as soon as the first freeze comes. We have had no trouble keeping golfers off the tees. The cups are changed every 300 rounds, winter or summer and we can not see as much wear now as in the summertime.

We close the course as soon as the frost goes out of the ground, and only rarely are we caught with golfers on soft greens. I can never remember closing a course for winter play as far back as 1930.

Here we have extended good will to a number of golfers. The men and women that play in the winter are real golf fans; they are our biggest boosters. There certainly is some extra effort necessary to keep a course open in winter but then summers are no picnic either.

Sincerely,
Harry Burkhardt
Mgr., Shawnee Hills, Bedford, O.

Drainage was the term most frequently used to secure the ultimate in playability and ease of maintenance. Many maintenance headaches have been caused by faulty drainage, nearly all of which could be avoided by a better understanding of the principles of drainage and the application of these basic concepts. There is surface drainage; internal drainage; subsurface drainage; and air drainage. Each is important but all must work in perfect harmony. To violate even one phase of drainage can nullify the total effects of good construction.

Space Problem Here, Too

Space concepts received a thorough airing. Space for cup changes, space for cart traffic, space for operating maintenance equipment between greens and bunkers, space for turning mowers at green edges, space for teeing areas, etc. It boils down to the principle of spreading the traffic to

(*Continued on page* 142)

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Turf Schooling— It Offers Big Opportunities

Facts and Figures for Last Five Years from Stockbridge School Show that Turf Management Graduates Are Faring Well on Golf Course Jobs

By ELIOT C. ROBERTS*

Joseph Troll, instructor in Turfgrass Management, works with three Stockbridge turf majors, Connie Ovian, Larry Thompson and Sam Delmolino (l to r) on an exercise in grass identification.

THE question often is asked, "Are opportunities in turfgrass management good for a college trained man?" The answer is decidedly yes. The University of Massachusetts sponsors a two-year course in practical agricultural science known as the Stockbridge School of Agriculture. Among 12 major courses of study offered is turfgrass management. Records of student enrollment, academic achievement and job placement for the past five years indicate a bright future for young men trained in this specialty.

An interest in plants and plant science is essential for a student entering a college course in turf management. High school students who enjoy studying biology, chemistry, mathematics and physics and also like working with ornamental plant material do well in turf work. Those most successful in this field have a fondness for outdoor work. For them there is a challenge in creating and maintaining beautiful surroundings, and opportunity in working closely with nature and living plants. They like the close association with sports and sportsmen. Caddies and golfers, because of their close contact with fine turf, frequently become interested in turfgrass management as a career.

Experience May Be Limited

Previous experience in turfgrass work or allied fields may allow one individual to advance faster than another. However, it is not an essential ingredient for success. Although a few men with experience in surpervising maintenance of golf courses have enrolled at Massachusetts, most students come with limited experience.

Previous education and training of students majoring in Turf Management has varied from those who are high school graduates to men holding degrees from colleges, universities or technical schools. In most cases the degree of interest in turf works counts more than previous educational training in predicting success in this

Age of students has varied from 17 to 46. There is (within limits) no direct relationship between age and early advancement in turfgrass management. Many young men in their early twenties have been just as good students as their older classmates and often become superior supts. The maturity of the individual, rather than his age, is the factor which, when allied with technical competence, determines the ability to assume a superintendent's responsibility. This maturity of the student is also reflected in part by his ability to study and produce good work while in college.

During the past five years 67 men have

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* *Until Aug. 1, 1959 Dr. Eliot C. Roberts was a turf specialist at the U. of Massachusetts. He left this position to take a similiar post at Iowa State University, where he succeeded the late Prof. Harvey Lantz. Roberts worked under Prof. L. S. Dickinson at Massachusetts, was in charge of the school's eight-week and two-year short courses, and is specializing in research at Iowa State*