

upon their financial structure. The major advantage of a leasing program is the elimination of an immediate capital outlay. Most manufacturers offer a leasing or lease-buy program. An evaluation should be made of each piece of equipment presently owned, including performance, reliability, yearly maintenance costs, repairs that are needed, present worth and expected life. Next, an evaluation should be made of what is available to replace that piece of equipment. Only after comparing the presently-owned equipment with the replacement equipment should the decision be made about replacing equipment.

A continual analysis should be made of what lines are available in new equipment. There are many new advances in equipment that can result in better performance at a lower cost. Many of these products can effectively reduce the man hours needed to perform a given task, which can also result in less golfer irritation and interference.

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### Chemicals

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The field of golf course chemicals is in flux. Local, state and Federal regulations have forced the removal of some important chemicals from the market. Chemical companies have stopped producing some products that had become a trademark in the

golf course superintendent's profession. However, many new chemicals have recently been developed which have shown excellent results.

Spokesman for several of the leading turf chemical companies have stated that they do not anticipate any price increases, except possibly in the line of herbicides. Fungicides, usually forming a high percentage of the chemical budget, should hold their own with little, if any, rise in cost. The new systemics will remain high in cost per pound, but competitive in the total chemical picture because of their long-range effectiveness. Before a superintendent calculates his estimated cost for chemicals, a chemical program must be established. Although the chemical program will probably be altered as the season progresses and individual problems arise, establishment of a general chemical program should prevent unexpected costs in chemicals.

In establishing a chemical program the previous history of the golf course and the products used should be assessed. Each chemical that has been used or is contemplated being used should be evaluated carefully. Some of the many factors to consider are: Active ingredient, acid equivalent, toxicity, LD50, compatibility, additives, ecological effects, safety, rate of application, method and ease of application, performance, reliability, re-

liability of the manufacturer, cost per unit weight, cost per application per unit area and cost per unit area per unit of time.

It should be remembered that the cost of applying the chemical should be considered when making out the budget. A longer lasting chemical, such as the new systemics, may cost more per chemical treatment, but because less applications are needed, the over-all economic picture is more favorable. When a switch in products is being contemplated, the product should be tested by the superintendent on a limited basis first, preferably in an area not heavily used or noticed by the golfers.

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### Supplies

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Supplies that are needed to keep the golf course in operation will continue to increase in cost. It is anticipated that the price increase for the coming year will be in the neighborhood of 5 per cent. The need for supply items can be greatly affected by the amount of vandalism on the golf course. Many clubs must spend several thousands of dollars per year replacing stolen or damaged items, such as ball washers, flags, flagpoles, tee markers and benches.

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### Repairs

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The cost of repairing equipment will rise again this year. Parts will generally show a 5 to 8 per cent increase. The labor involved in service departments is expected to increase 8 to 11 per cent. Some equipment distributors have pledged to hold the line with regard to possible price increases within their service departments, but it is hard to believe how they can and still make a profit as their costs continue to soar.

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### Preparation of the budget

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The preparation of the annual golf course budget is one of the most important responsibilities of the golf course superintendent. At most clubs the superintendent is responsible for originating a budget which he then presents to the greens committee for review and possible changes. The greens chairman then presents the budget to the board of directors for final approval. In some

(Continued)

#### Breaking down the budget

By the time the preliminary work has been accomplished, the superintendent has completed the vast majority of work required in the preparation of the budget. After the needs for the next year have been determined, an inventory check will determine what materials will have to be purchased during the budget year. The budget should be formed in such a way that the average member of the greens committee or board of directors can understand the budget and where the expenditures are located. The budget should take the same form from year to year to facilitate comparisons of items within the budget. Accompanying the budget should be an item by item explanation of the costs, especially any changes from the previous budget.

Accompanying next year's budget should be last year's budget and a summation of last year's expenses. This is very helpful, because it shows what was allocated and spent to accomplish last year's maintenance practices.

The budget must contain at least the following broad categories: 1) salaries and wages; 2) materials; 3) repairs; 4) services, and 5) new equipment. Usually the budget is expanded to show a greater breakdown of costs. The following list shows 26 different categories that might be found in a typical superintendent's budget.

Salaries, wages	Chemicals (fungicides, insecticides, herbicides, fertilizer)	Water
Payroll taxes	Top soil and soil amendments	Telephone
Association dues	Grass seed	Uniforms
Conference and meeting expenses	Landscaping	Laundry
Insurance	Golf course repairs	Employee meals
Housing	Equipment repairs	Printing
Light, power	Depreciation	Supplies
Heating fuel	Tree maintenance	New equipment
Gas and oil		Miscellaneous

instances, a finance committee will review the budget before presentation to the board of directors. Whenever budgetary discussions are held, the superintendent should always be present to answer any questions.

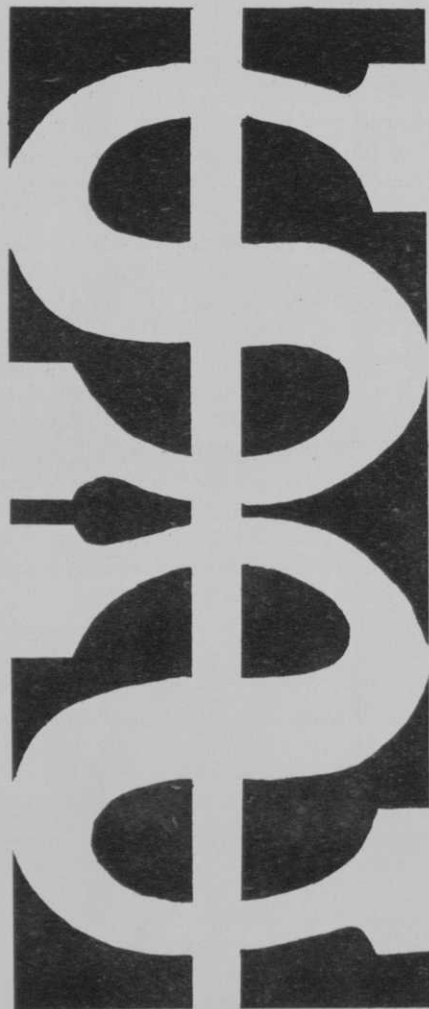
Basically, a budget is an estimated cost of operation for a certain period of time. Once a budget has been adopted, it is the superintendent's responsibility to manage his department within its limits. Under unusual circumstances a budget may be exceeded, but this should only be done with the approval of the board of directors. It must always be remembered that the golf course budget is only one part of the club's fiscal picture. Once adopted, changes should not be made without due consideration of the entire financial status of the club.

Before a budget can be properly planned, the club should spell out its objectives regarding the degree of excellence desired in the conditioning of the golf course. The budget is a direct reflection of the degree of conditioning which the club officials desire and feel that they can afford for the golf course operations. In essence, when the board of directors adopts a budget, they are setting a policy which will control the financial operation of the golf course and will have a direct bearing on the ultimate quality of the course.

Some superintendents build an excessive cushion into the proposed budget, feeling that the budget will be cut by various boards and committees and, in the end, the superintendent will get what he is actually looking for. This approach is not only very misleading, but is a reflection on the integrity of the superintendent. If a board or committee finds too much padding and unnecessary items in a budget, the superintendent may end up looking for another job.

A better method is to present a budget that truly reflects the anticipated operational expenses. A supplementary budget containing costs for proposed projects and improved services should be attached to the actual budget. This will give the various committees and boards an opportunity to consider the costs for improving their facilities and the alternatives that are

available to them. Because it is the superintendent's responsibility to draw up a sound budget which reflects the desires of the membership and club officials, there can be no substitute to proper budget planning. Many hours of preparatory work are needed before a superintendent



even starts work on the actual budget sheet.

The superintendent, before starting to prepare next year's budget, should evaluate the total golf course operation during the past year. The evaluation should contain his own appraisal of the operation as well as the viewpoints of the membership and club officials. The evaluation should cover the weak points in the golf course program last year and how they might have been avoided as well as the program's strong points and how they were attained.

It is imperative to keep a complete set of records containing the daily weather, rates, dates and reactions of all chemical applications, routine

maintenance procedures, special projects, inventory, expenditures and payroll. Maintenance records should be kept on all equipment, showing the use and maintenance work required to keep each piece of equipment in operation. Only through proper evaluation of the previous year's operation, can the superintendent determine if changes and improvements are needed.

In order to properly prepare a budget, the superintendent must first determine the standards which he wishes to attain. Sometimes the maintenance standards must be lowered because of the economic situation of the club. More likely, the club will want to improve its services to the members.

If course improvements are advisable, it is the responsibility of the superintendent to take the initiative and present improvement programs which can be accomplished. Each program should be outlined as to why it is needed, what it will accomplish and how much it will cost. There are many questions that should be asked in the preliminary work of preparing a budget. The answers to the following questions should serve as a guide in the final preparation of the budget.

- Will the standards attained last year be desirable next year?
- What is needed to correct last year's deficiencies?
- What improvements would the superintendent recommend?
- What improvements would the membership like?
- What improvements would the green committee and the board of directors like?
- What is the fiscal status of the club and the economic outlook of the community for the coming year?
- What costs are going to increase or decrease?
- What effect will new local, state and Federal regulations have upon your operation?
- How can you more effectively manage the golf course?

Charles G. Baskin is superintendent at the Country Club of Waterbury, Waterbury, Conn. He is a national director of the Golf Course Superintendents Assn. of America, president of the Connecticut Assn. of Golf Course Superintendents and a member of the advisory board of the Connecticut Section of the Professional Golfers' Assn.

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# Show Them Where the Money Goes

By Ted Smith

President, Smithco Inc.

**An annual display of turf maintenance equipment, steam cleaned and painted, has been an important communication tool for Dominic Thomas at Huntingdon Valley. The display impresses members with the scope and importance of the superintendent's job and helps lower resistance to future purchases of new equipment**

"The membership just does not appreciate the necessity and high cost of turf maintenance equipment which is needed to achieve the playing conditions they demand."

This phrase has probably been said by many superintendents faced with the tasks of golf course maintenance today. Costs of labor prohibits the luxury of hand mowing greens, trap raking, night watering, weed pulling and the various chores which before only men could perform. Labor

has been replaced by sophisticated machinery. New developments in turfgrass and efforts of the Golf Course Superintendent's Assn. of America and the U.S. Golf Assn. Green Section have all helped to upgrade the professional status of the superintendent in the eyes of the membership. He no longer just "cuts grass."

The day when the superintendent could spend all of this time strictly on golf course maintenance has passed. Now the superintendent finds himself engaged in increasing communications with his members and the surrounding community. As income into the club continues to decline, and with assessments and dues reaching the saturation point, the costs of labor, equipment and turf management continue to put the superintendent on the spot with his membership. Memberships continue to demand superior playing conditions, but are not always ready to pay for the cost of this luxury.

Dominic Thomas, superintendent at Huntingdon Valley CC, Hunting-

don Valley, Pa., has found the solution to this communication gap by giving the membership a greater insight into the scope and importance of course maintenance and the need to continually purchase and upgrade equipment.

The solution is so simple and practical, that it is amazing that the procedure is not a standard practice at all clubs.

The communications program Thomas conducted with the membership at Huntingdon Valley was based on a special three-day, open-air display of the many and varied pieces of equipment required to maintain and improve the attractive 18-hole, 300-acre course. The program, inaugurated two years ago, was planned for the day of the club's annual meeting when the board of directors and a majority of the membership would be on hand. The display was kept over the weekend so that everyone could see it.

Plans for the display began during the winter—that time when bad weather blankets most of the courses



*Tools of the trade: The 53 pieces of equipment at Huntingdon Valley are arranged in front of the clubhouse.*

in the North bringing operations to a standstill. Thomas and his ground-crew nucleus of four began a clean-up campaign on all of their equipment. Armed with a steam cleaner, grease gun and paint brush, 53 assorted pieces of gear, ranging from tractors and seven-gang mowers to snow blowers and trap edgers were overhauled, cleaned, greased and repainted by Thomas and his crew.

These items were then put on display attractively arrayed on the lawn adjoining the clubhouse. Superintendent Thomas and his staff were on hand to explain to the members each piece of equipment and its role in maintenance operations.

One of the bonuses of the tearing-down, rebuilding and refurbishing of the gear throughout the wintertime was the increased operating efficiency and life of the equipment. Thomas has been conducting this wintertime clean-up program for 30 years and claims it can add up to 10 years of life and performance on the piece of equipment.

"One good example in this equipment maintenance program," Thomas says, "is that I still use the first verticutter ever made and it looks and performs like new. This 20-year old piece of equipment was included in the display, and most of the members thought it had recently been purchased because of its sparkling new looks."

Thomas' budget calls for some \$15,000 to be spent on equipment over the next three years. "This can be attributable to the favorable reaction of members to the equipment display," he says. Bill Goldthorp, club president, and DeWitt Smith, greens chairman, both experienced unexpected dividends from the equipment display. "The display was an ideal means of pin-pointing for the board of directors and the membership at large the importance of our year-long program of maintenance, and the necessary budgetary dollars that go with the program," according to Goldthorp and Smith.

"Planning is the keynote of the total operation at Huntingdon Valley," says Larry Higgs, general manager, "and a viable five-year turf maintenance plan has been developed to cover all foreseeable contingencies and insure continuation of a satisfied membership as well as beginning new programs for the future." Thomas

now has the knowledge that he can plan a three or five year seeding program with the assurance that he will have the equipment available in the future to meet the needs of the seeding program.

"We know that the average member appreciates our work in a general way," Thomas says, "but this display of equipment really brought home the tremendous number of operations we go through to insure them the best playing conditions. I



*Members are able to walk among the cleaned-up equipment at the club's annual spring membership meeting.*

expect less annoyance when we slow down a foursome as we're finishing cutting a green or when we are aerifying," he says.

The membership is also enthusiastic about the equipment display. Comments from many members centered upon a number of newly acquired items added to the Huntingdon Valley equipment lineup to perform various operations formerly carried out by manual labor. Thomas was on hand to point out how the ever-growing shortage of work force candidates was being met by mechanized operations.

"Today's country club has developed into a big business complex," says general manager Higgs. "With increased Government intervention in the form of Internal Revenue Service guidelines or Supreme Court decisions, to the need for computerized billing and accounting procedures, or the need for turf management practices, there is a need for professional management.

"Thomas and Higgs have supplied the professional management needed

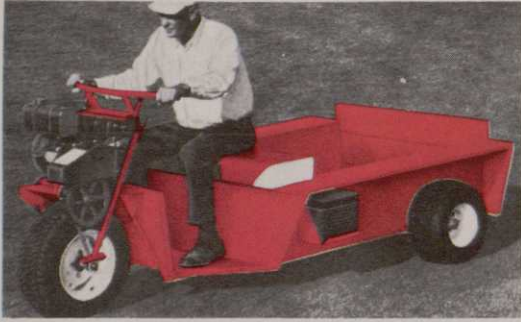
to make a country club a success," says Goldthorp, "and keep us abreast of the changing times. Through their efforts of communication, both between themselves and the membership, a continuity of management has been achieved which has supplied the club with activities to appeal to all members of the family: golf, swimming, tennis, squash, bowling and trap shooting." Growth is assured at Huntingdon Valley through a very favorable dues schedule for sons and daughters and junior members.

"We don't believe in a minimum house charge," says Higgs. "We want the club to offer a variety of activities to the members without them feeling coerced to attend." The management team of Higgs and Thomas represent a total of 66 years at Huntingdon Valley. Thomas is a 43-year veteran, with Higgs serving as general manager since 1948.

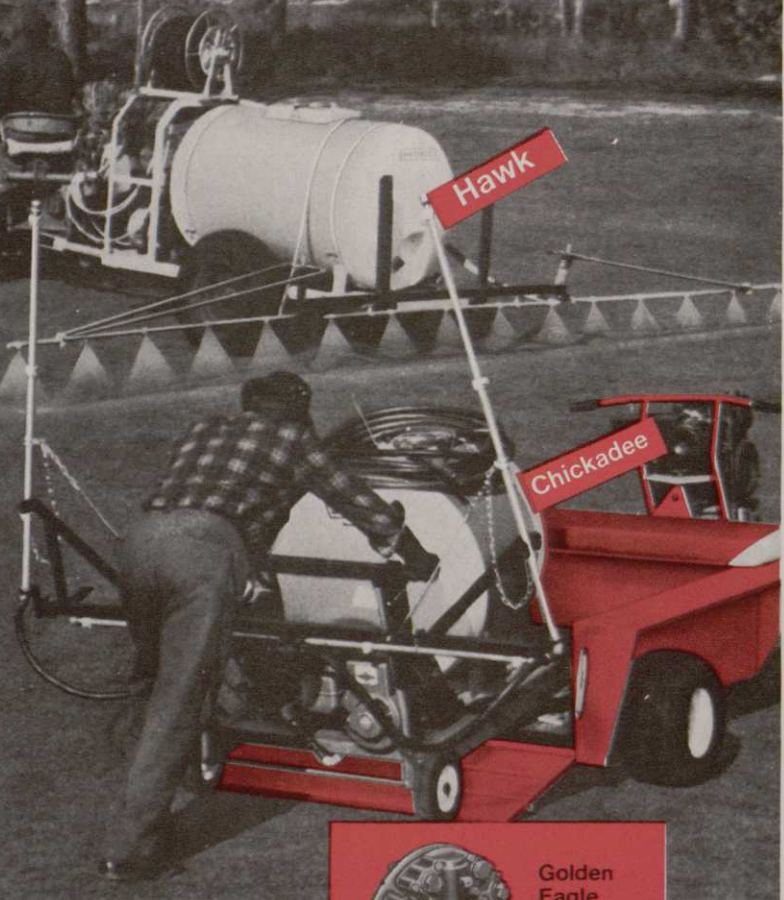
"In some clubs this amount of longevity might be construed as stodgy, staid, entrenched management," says Goldthorp, "however, in the case of Huntingdon Valley, it means the membership has confidence in their guidance and management philosophies."

Contrary to the dwindling emphasis now being placed on the role of committees in the operation of the country club, Huntingdon Valley encourages committee participation. "With proper guidance, committees are a very good way to get the membership interested in the operation of their club," says Goldthorp. "They act as a buffer between the members and club officers and offer a great deal of executive, merchandising and business talent which you couldn't afford if you had to go to the outside to purchase. The result has been positive attitudes towards change and good constructive criticism."

"A well-run, successful country club calls for many ingredients," Higgs sums up, "and one of the most essential elements is close attention to constant improvement of playing conditions. Excellent teamwork with the superintendent is a prime requisite. We have this in abundance with superintendent Thomas and his staff and we welcomed the opportunity which this equipment display provided to underscore their vital contributions to our membership." □



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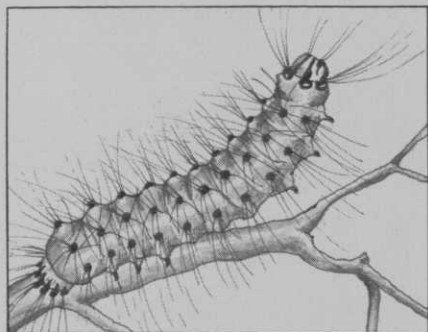
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# The Gypsy Moth Invades Northeast



For the second consecutive year the pest gypsy moth, *Porthetria dispar* (L.), is ravaging golf courses in the Northeast by defoliating trees. The gypsy moth is a serious problem in Westchester County, N.Y., and Fairfield County, Conn. The moth has also reached epidemic proportions in sections of New Jersey, northern New York, Massachusetts, Rhode Island and in northern New England. Infestations have also been found in Pennsylvania and Michigan.

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## History

The gypsy moth is a native of Europe, Asia and northern Africa. It was introduced into Massachusetts in 1869 by a French naturalist who was conducting experiments with silkworms. Within the next 20 years, the species had increased and defoliated a number of forest, shade and orchard trees in the Northeast. Since that time, the gypsy moth has gradually worked its way north, south and west.

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## Hosts

Tree species preferred by the larvae of the gypsy moth are oaks, willows, poplars, speckled alder, basswood, apple, gray birch and river birch. The larvae will also eat cherries, elm, hickories, chestnuts, maples and have been known to eat native eastern pines and spruces, southern white cedar, hemlock and beech. The tree species disliked by the larvae include black walnut, butternut, ash, catalpa,

flowering dogwood, American holly, yellow poplar, locusts, sycamore, red cedar and balsam fir.

One complete defoliation will usually not kill thrifty hardwoods, but may be fatal to conifers. However, repeated defoliation of hardwoods will reduce their vigor so that other insects and disease-producing organisms may cause the death of some of the trees. Tree losses have been noted after one or two years of complete defoliation during drought periods.

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## Description

The non-flying female gypsy moth does no damage to the trees. She is nearly white with yellow to buff hairs on the abdomen. The forewings are marked with irregular blackish bands. There is a line of black dots near the outer edge of the wings. Wingspread is about two inches. The flying male moth also does not damage the trees. He has a brown body and light to dark brown wings with black markings.

The eggs of the gypsy moth are usually deposited on the heavy bark areas on trees (usually the trunk and larger trunk limbs). The egg masses contain from 100 to 700 or more eggs covered with the buff to yellowish hairs from the abdomen of the female. Each egg mass is approximately one inch long and one-fourth inch wide. Each tree usually contains many egg masses, some completely covering the tree.

The larvae stage (the one which does all of the damage to trees) emerges over a six-week period from early May to mid-June. The hairy caterpillar or larvae is between one and two inches long and one-fourth inch wide. It has a dusky to sooty colored or slate-colored body, and on the back, behind the head, a double row of blue spots (five pairs) followed by a

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The gypsy moth is again defoliating large numbers of trees. GOLFDOM examines the problem and offers some suggestions on identification and control

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double row of red spots (six pairs). The larvae start by eating pin holes in the leaves of preferred plants and as they become larger, devour all green plant material on the host plants. By July they are fully grown and spin a few strands of silk and transform to the pupal or resting stage. In about 17 days, the moths emerge. There is one generation a year.

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## Control

Although the eggs of the female have already been laid for 1972, natural biological controls and chemical controls can prevent the gypsy moth from hatching and raising havoc for 1972. Scraping off the egg masses is one way of control. Low temperatures also cause egg mortality. Insects that are predators or parasites (certain species of flies, wasps and beetles) attack various stages of the gypsy moth. Disease producing organisms also take their toll on the moth. Because the gypsy moth overpopulates, it is sometimes self-destructive because after stripping the trees in an area, the moths may die from a lack of food. Although all of the above natural controls contribute towards retarding population, insecticides are still the only way man is able to prevent serious damage. (The preceding information was supplied by the State University College of Forestry at Syracuse, N.Y.)

Because of the controversy surrounding DDT and lead arsenate (they are banned in some states) the best substitute to date in killing the gypsy moth at any stage in its life cycle has been Sevin (carbaryl). Federal and county governments have been spraying park lands with Sevin to kill the moths. Although Sevin has a shorter residual life and is far less toxic to mammals than DDT, in some forms it is still toxic to bees, so

(Continued on page 67)

# Automatic Irrigation: Within Everyone's Budget



Dick Toupal at one field controller station.

In the last few years more and more golf clubs throughout the country have begun accepting the idea that the quality and success of a club depends on the quality of its turf. Faced with the necessity of predetermining priorities for capital investment, many superintendents and greens committees have discovered that turf conditioning provides by far the best financial return. Committees are realizing that a properly engineered, installed and maintained automatic sprinkler system can be one of their best investments towards insuring good quality turf for the future.

This realization is a radical change of thought on the part of golf course superintendents and greens committees, because an automatic system at first appears technically and financially ominous. They have come to realize, however, that the long-range benefits outweigh the immediate outlay. There can be no margin for error when something as critically important as an underground irrigation system is installed. It must be done right the first time. With greater numbers of golfers insisting on top-quality turf, clubs that have switched claim the proof is evident—automatic systems are rapidly changing from yesterday's luxury to today's necessity.

One club which made the switch from manual irrigation to automatic was the North Oaks CC in St. Paul. The original quick coupling sys-

The large capital outlay required for installation of an automatic irrigation system may cause many superintendents to prolong conversion or installation. An automatic irrigation system is within the means of clubs' budgets and will pay for itself in the long run

tem, installed in 1951 when the club was still under private ownership, was not providing adequate uniform coverage. When the club became member-owned, the greens committee began considering installing an automatic sprinkler system as a way to curtail increasing member dissatisfaction with the playability of the course, and to cut down on increasing maintenance and labor problems. At first course superintendent Dick Toupal was skeptical. "When they started talking to me about automatics, I thought they were painting too rosy a picture. Now," he adds, "after two seasons with an automatic sprinkler I can't see how a course can afford to be without one, particularly if it is as trouble-free as ours."

A cost conscious club, North Oaks has a \$40,000 annual maintenance budget. This is considerably smaller by comparison to other top courses in the area which have annual budgets in the range of \$100,000 or more. Nevertheless, this summer, after several dry weeks, North Oaks' fairways and roughs were lush and green. Other surrounding courses suffered from burnt roughs and fairways and had to restrict golf car travel to prevent permanent damage to the wilted turf.

The new system had a dramatic affect on the basic condition of the course. Much of North Oaks' soil is very sandy and Toupal could not prevent many of the course's roughs and sandy crowns from drying out.



Automatic system provides uniform watering.

"Members were complaining that the course had become too easy to play," Toupal explains. "Many patchy dry roughs were giving as good a lie as the fairways." Golfers were cutting doglegs—deliberately hitting into the roughs.

The previous quick coupling system utilized a single row of sprinklers per fairway. If Toupal allowed more watering time for the edge of the fairways, he developed puddling and soft turf in the center of the fairways. To provide more uniformity, the new automatic system was designed with two rows of sprinklers triangularly patterned down the edge of each fairway. In this way, the sprinklers put out overlapping patterns which watered each fairway and rough in a 250-foot wide unscalped swath, extending well beyond the 120-foot width of the fairways. This insured a much more even distribution of water and ample coverage for the roughs so that golfers are now playing the course honestly.

The operation of the system has also been streamlined. Each of the four water cycles, greens, tees, fairways one and fairways two, can now be scheduled from the maintenance building. Twenty-four hour time clocks normally located at the field controllers have been centralized within the maintenance building's four Buckner CP-2 central programmers, eliminating the time involved traveling to each individual field controller. In addition, the system's



20 Buckner FC-10 field controllers have been consolidated within seven locations throughout the fairways to increase the "invisibility" of the system and to minimize the time involved in servicing or making individual valve timing changes. Each location is also equipped with lightning arrestors and 110-volt outlets encased in steel and bolted to concrete pads to prevent costly damage from vandalism.

Although the system was improved considerably, Art Magnuson, Milco, Inc., Minneapolis, who engineered the sprinkler system, went one step further. He designed a custom-built "selectivity panel" in conjunction with the course's four central programmers. This increased control of the uniformity and coverage of water output at several trouble spots.

Located below the four central programmers in the main maintenance building the panel reads horizontally as an actual hydraulic map of the course, providing a visual aid for better irrigation decisions. The panel consists of one "omit" switch per field controller, labeled with the appropriate fairway, greens or tees number. The switches are also arranged in the same configuration they have in the field to provide easier identification. The superintendent can thus eliminate one or more field controllers in a cycle. By adjusting each individual field controller he can isolate them from the course's 167 valves for individual coverage of dry spots, all from the maintenance building. Because the system was designed to provide one controller per fairway, the selectivity panel is meaningful in obtaining the exact amount of water needed for each individual soil and turf type throughout the course.

Sprinkler irrigation has traditionally been thought of as supplemental to rainfall, but Toupal found that with his new equipment, rainfall was actually supplemental to his sprinkler system. One example of this greater climate control is the sophisticated syringing cycle of the central programmers at North Oaks. Overriding the normal field controller timing of each valve, the syringing cycle can vary in length from 1.5 minutes to five minutes, providing three exceptional functions. In the summer when the turf becomes particularly hot, a quick syringe cycle in areas void

of players cools the grass significantly. This is particularly useful at the greens and tees. Disease can also be minimized by syringing in the morning, providing just enough water to dilute the dew on the course. In the spring and fall, syringing acts as a frost control. The cycles can be scheduled periodically throughout the entire night, if necessary, to provide the club with a significant number of additional good golfing days in the early spring and late fall, without damage to the course.

While the advantages of an automatic irrigation system are apparent, the need for the complementary high quality materials often is not. In reviewing bids, North Oaks chose quality over cost. For example, the original main lines that were still in good condition were salvaged during conversion. When

cal wiring and 41,000 feet of high molecular pipe were installed. Two seasons later, the system has not experienced a single break! "One break in an installed line can cost between \$10 and \$100 to fix after the system is operative," Magnuson adds. "Over the years these repairs can mean the difference between the financial success or failure of a system." Some industry sources estimated that systems the size of North Oaks' normally experience an average yearly maintenance cost of between 2 to 5 per cent of the total installation cost. Two full seasons after installation, North Oaks' maintenance repair cost has been well under .5 per cent annually.

Magnuson is quick to point out, however, that any automatic system will require additional turf care and necessitates a revamping of the



*Coordinated operations are provided by custom-built control panel, located below central programmers in the main maintenance building at North Oaks.*

new materials were needed, however, 200 pounds-per-square-inch PVC pipe, rather than the normal 160 psi, were used. This added strength provided an extra margin of safety in the design of the system.

An example of North Oaks' adherence to quality materials was the use of high molecular, high density flexible polyethylene pipe. It carries a minimum 20-year guarantee against pinholing, cracking or splitting, will expand when water is frozen within it, and when thawed will return to its former shape. This type of quality product assures North Oaks of long-term maintenance savings. Over 540 pop-up sprinklers, 167 electric valves, 66 miles of electri-

existing turf maintenance program. For example, areas receiving more water, in North Oaks' case the roughs, may require additional mowings. An adequate regular fertilizing and chemical program should also be reviewed in normal turf maintenance.

In addition to improving the condition of the club's turf, the automatic system provided significant savings in labor costs. North Oaks' greatest labor savings came from the elimination of their night watering crew. This represented an annual savings of between \$5,000 and \$6,000. This alone represented a 12.5 per cent reduction within North

*(Continued on page 58)*

# The Metrics Are Coming!

The proposed conversion to the metric system as a standard of measurement will affect everyone, including golf professionals, club managers and superintendents. Mastery of the system is not beyond most people and it is a precise and constant system

By Fred V. Grau

In the months and years to come there will be many heated discussions, both pro and con, regarding the proposed conversion to the metric system in the United States. The proposal, made in July by the Commerce Department, asked Congress to create a "central coordinating body" to guide the nation through a 10-year conversion to the metric system. America is the last major industrial country in the world to cling to the archaic "inch-pound" English system. The exception is our decimal monetary system, which is based on 10s and is very workable.

Metric refers to the meter, which is one ten-millionth of the distance along a meridian from the north pole to the equator. A meter is rational, precise and constant. (The French converted to this system at the time of the French Revolution.)

The English system is based on the inch as a unit of measure. How did the inch come into being? Someone laid three barleycorns end to end and called it an "inch." One wonders if that had been a good year for barleycorns and if the barley grains were plump.

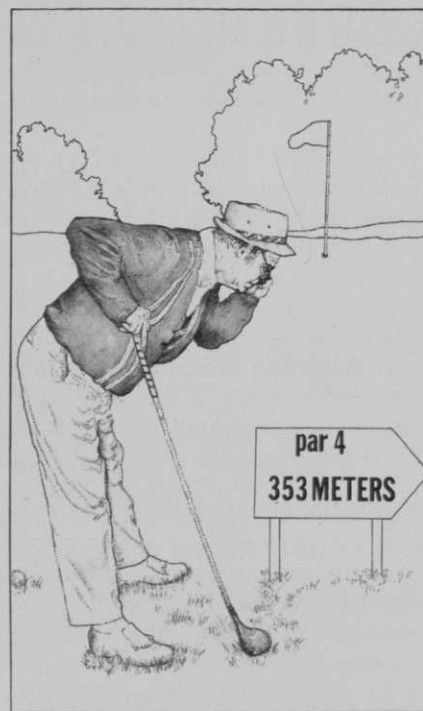
Metrics have been with us, if only peripherally, for a long time. The push is on, however, for a widespread conversion to this system.

In 1821 the Secretary of State, John Quincy Adams, reported on the desirability of converting the United States to the metric system. In 1866 the United States legalized metrics which, since 1893, has been used to calibrate the "inch-pound" system. About 1955 the pharmaceutical industry switched from grains to grams. The film industry, automobile in-

dustry and other specialized industries more and more use metric units of measurement. The American Society of Agronomy and the Soil Science of America accept no technical papers unless measurements are in metric terms. Turfgrass papers report height of cut in *cm* (centimeters) and weights in grams and kilos (kilograms). The National Aeronautics and Space Administration officials report depths below the moon's surface in centimeters and kilometers. A dual roll of paper towels that I bought recently had information on the package that each roll contained 100 sheets, each 27.9 cm by 23.9 cm (equivalent to 11 inches by 9.4 inches).

Curiously, the moon report on depths in centimeters and kilometers cited degrees Fahrenheit rather than Celsius; an inconsistency. Anders Celsius, a Swedish astronomer, first described the system in 1742. Essentially, the interval between the boiling point (100) and freezing point (0) of water is divided into 100 equal parts, hence the use of the word centigrade, which is used interchangeably with Celsius. G. O. Fahrenheit devised the thermometer scale that bears his name on which the boiling point of water is 212 degrees and the freezing point is 32 degrees above the zero on his scale. His zero was attained by mixing equal weights of snow and common salt.

It may come as a shock to many taxpayers that the National Bureau of Standards, which is part of the Commerce Department, released an 11 volume report on July 29th that cost \$1.3 million and took three years to



complete. The title is "A Metric America: A Decision Whose Time Has Come." The report proposes a 10 year plan to convert the nation to metrics—"predominantly, though not exclusively..." The conversion would begin in education and international engineering standards. The over-all cost to manufacturers might run from \$10 billion to \$40 billion and could increase export trade to metric countries by one to two billion a year. To allow the nation casually to drift into metrics might take 50 years and would cost far more than the 10-year Government coordinated plan. In two or three decades, the United States would recoup the cost if it worked at it. If we drift it may take eight or nine decades to recover the costs.

It is of more than passing interest that the states, not the Federal government, are largely responsible for enforcing weights and measures and for assuring uniformity. It is significant also that the Government does not seem to be determined to eradicate customary measurements even though the tide of metrification proceeds relentlessly. Beauty contestants undoubtedly will continue to be publicized as "36-23-36" (or similar) rather than the metric equivalent. Turfgrass devotees undoubtedly will cling to "1,000 square feet" for a long long time.

Sod growers, though, may find it less difficult to market "square meters" of sod rather than square yards.

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