Automatic Irrigation: Within Everyone's Budget

Dick Toupal at one field controller station.

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

Automatic system provides uniform watering.

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 system, 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. "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 unscalloped 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, Milsco, 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 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 electrical 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 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)

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

Automatic irrigation

continued from page 39

Oaks' annual maintenance budget. Because the cost of labor continues to rise rapidly, this savings is expected to increase sizably over the next few years.

Through careful engineering, the automated system has significantly reduced North Oaks' actual sprinkling time. This not only means better utilization of water and lower pump costs, but reduced man hours as well. Previously Toupal required one man full-time around the clubhouse eight hours a day specifically for irrigation. He now uses one man 5½ hours a day. In addition, the shorter irrigating schedule means more late night and early morning golf time. The old irrigating schedule called for watering from 7:30 p.m. until 8 or 9 a.m. With the new irrigation system, Toupal could wait until 9 p.m. to begin the evening's sprinkling, well after the last golfer had headed for the clubhouse. In addition, he had completed his cycles by 7:30 a.m., in time to run a quick syringe over the course before the first golfer had time to tee-up.

The end result for North Oaks has been a much improved, more challenging course for its members. "Two seasons ago members were constantly on my back about the shoddy condition of the fairway edges and roughs," says Harry Olson, club manager. "We recently held a golf guest day and many of the people playing the course told me they felt we had the most enjoyable course in the Minneapolis-St. Paul area," he says. "I'm particularly pleased with the increased number of golfers we have in the mornings and late evenings."

To date the North Oaks system has been a success. "We are totally satisfied with the design, engineering and operation of the system," says Leo Mariani, greens chairman. "The few problems we have incurred have all been man-made."

Today a system similar to North Oaks' could cost $120,000 including the entire clubhouse area and practice range, excluding pump stations and pressure maines. This is completely offset by the assurance that the system will operate with maximum efficiency giving the course increased playability with a minimum amount of labor and maintenance. □

Grau

continued from page 22

Q— *We've heard the 1966 Pennsylvania Turfgrass Survey extolled as "the first authentic survey." Can you explain the basis for the "authenticity"? (Hawaii)*

A—The label "authentic" was given to the 1966 Pennsylvania Turfgrass Survey primarily because it was conducted by the Crop Reporting Service under the guidance of the Secretary of Agriculture Dr. Leland H. Bull. The Crop Reporting Service over a period of years has perfected a system of sampling various phases of agriculture wherein a high degree of accuracy has been achieved. The Turfgrass Survey was the fortunate recipient of this highly developed A.Q. (accuracy quotient). Nothing was estimated. Each published figure was derived from computerized calculations based on data obtained from accurate samplings.

We need more such authentic surveys in order to have unassailable facts and figures to give us support when we request needed tax support for our coordinated programs.

Q— *When we have soil tests run we get values for Ca and Mg with suggestions for rates of application to maintain certain levels. Can you explain briefly just why calcium and magnesium are important to us for growing superior turf? (Virginia)*

A—Calcium deficiency promotes failures in the development of terminal buds and root tips. Magnesium deficiency creates loss of green color between the veins of leaves. Calcium builds strength and rigidity in cell walls and helps turf resist wear. It is important in the manufacture of proteins, in nitrogen up-take and in the enzyme systems. Magnesium is vital to enzyme systems and is the only mineral element on which the chlorophyll molecule is built. Chlorophyll is vital in energy conversion. Both elements help to maintain proper pH levels in the plant as well as in the soil, thus maintaining a correct chemical balance.

Calcium and magnesium are furnished in dolomitic limestone, an inexpensive material that is universally available on the market. □