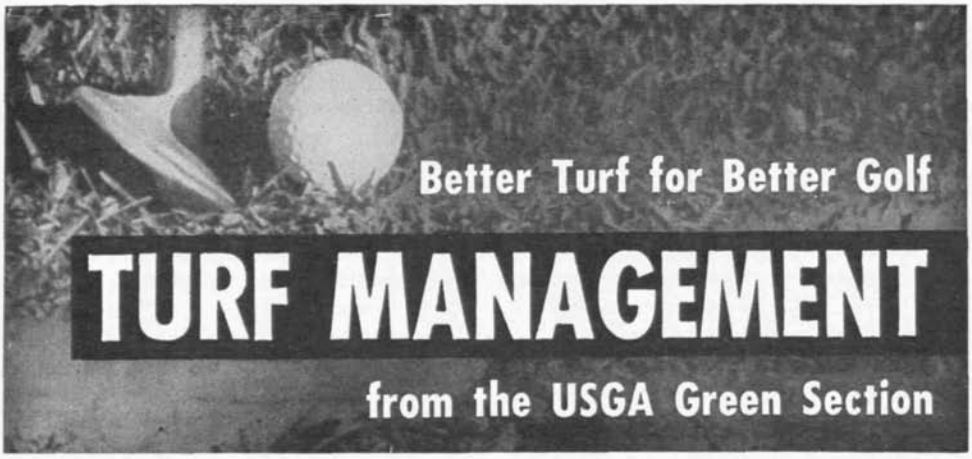

INSTALLING WATERING SYSTEMS

By ELMER J. MICHAEL
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EACH year with good economical conditions prevailing, more and more golf clubs are installing, or considering the installation of, fairway watering systems for it is becoming increasingly evident that regardless of the best of cultural practices, fine fairway turf cannot be produced and maintained in top playing condition throughout the dry summer season without water.

The ravages of heat and lack of moisture simply cannot be completely overcome during the fall and spring. Thirty days of drought does more harm to fairways than can be corrected during the rest of the year. Therefore, just as no club would consider building a golf course without providing water for greens and tees, neither should they fail to consider a plan to water fairways. The capital investment in such a project is more than offset by the additional enjoyment provided by their golfing facilities. This, of course, is true of the established course with unwatered fairways.

The benefits derived are quite obvious to most golfers. The soft, verdant turf is much easier to walk on and is more pleasing to the eye. The green, restful, as opposed to the parched, dried-out appearance of the course is a source of much enjoyment. The ball will sit up better on the thicker turf making it easy to play that wood shot. Iron shots can be played the way they should be without breaking the club shaft, wrists or back of the player. The green moist turf also has a tendency to cool the atmosphere on a hot day.

After considering all these benefits and perhaps seeing them on other courses, you no doubt agree that fairway irrigation is just what the doctor ordered. You may say, "We like it fine and we want it, but what's all this going to cost us?" This is certainly the first consideration of any plan.

There are very many circumstances which enter into the cost of an irrigation system; the first of which is the source of the water; secondly, the availability of power, pumping plants, soil conditions and contours. Contract estimates here in the Northeast for a complete hoseless system for an 18 hole course—fairways, greens, tees and clubhouse lawns—are running from $40,000 to $50,000.

Establishing irrigation on a course in operation costs 7 to 10 percent more than the system which is installed at the time the course is constructed. This is due to the necessity of lifting and relaying sod. It is also usually necessary to use lighter equipment; excess earth from the trenches is more difficult to clean up and dispose of.

The ideal time to establish irrigation is

at the time the course is built. There are many benefits to be obtained by doing the job at this time. First, a strong turf can be developed in a much shorter time. Second, the type of seed sown and turf developed at this time will remain as the permanent turf. In other words, seeds of grasses that are tolerant to and favored by water would be planted; namely, the bents, creeping fescue and perhaps Merion bluegrass as opposed to Chewings fescue, Kentucky bluegrass, Canada bluegrass and Redtops.

Also, *Poa annua* will not be as much of a problem. Those who have installed irrigation after their courses have been established have found that those fine fescue plots will disappear in about a year's time. Also, after a course is irrigated, the players usually demand that the mowers be set lower, say $^5/_8$" to $^3/_4$". It is then that Kentucky bluegrass will begin to fade out for this grass does not like to be clipped so close. It is necessary, therefore, that the club which irrigates established fairways, immediately starts a turf renovation program, heavier fertilization, reseeding to more permanent grasses and other measures necessary to control the advance of chickweed and *Poa annua.* If this type of program is followed much time and money will be saved in the long run.

Should a club decide to irrigate, it is necessary to proceed in three steps as follows:

1. Arrange for financing the project.
2. Find an adequate source of water.
3. Hire a competent engineer to design and supervise the installation of the system.

Arranging for Financing the Project

There are, of course, numerous ways in which such a project may be financed. The club's Board of Directors would best know how to solve this problem. One plan that has worked out very successfully is a tax on each round of golf. Under this plan the club borrows the amount of money necessary to make the installation. After or before the installation is completed a charge of 25c to 50c per round is collected. In this way the loan may be repaid in a fairly short period of time.

An Adequate Source of Water

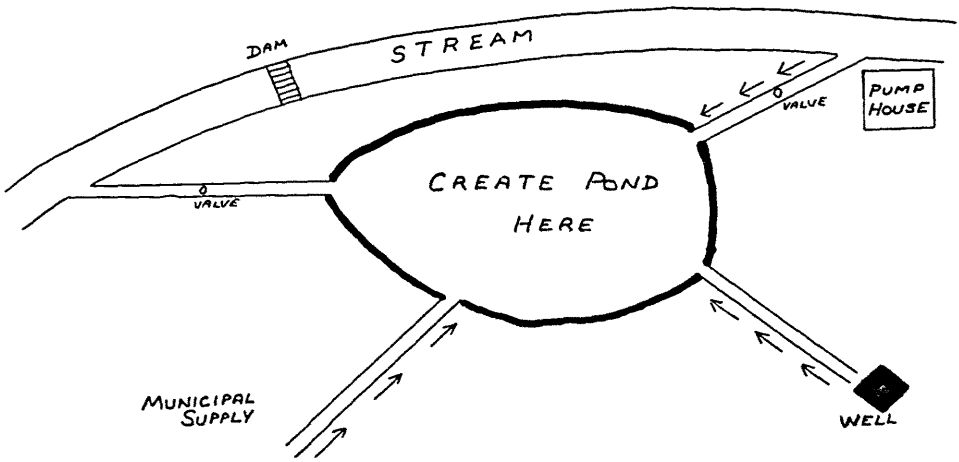
This will require very careful study for the whole operation of the system is predicated on the amount of water available. In most cases about $1^1/_2$ inches of water per week will keep fairway turf in good shape in all but the most severe drought. This amounts to roughly 200,000 to 250,000 gallons per day for an 18 hole course. The peak water requirement in the Northeast is from June 15th to August 15th.

Having established the amount of water required, it is now necessary to secure, as nearly as possible, an infallible source of supply. Naturally, if there is a visible source, such as a creek, river or lake nearby, with sufficient supply, it would be wise to use it even though the expense of getting it to the property may be considerable If one must rely on wells it may require considerable expenditure to explore and establish a well or wells of sufficient capacity.

It is possible that the best method may be the creation of a reservoir on the course, this to be fed by one or a number of wells. The reservoir pond or lake should be made large enough for at least a two day or larger supply. By this method the well or wells that would supply 160 gallons per minute pumped to the reservoir for a twenty-four hour period would total 230,400 gallons. This in turn may be pumped at the required pressure and volume into the sprinkler lines and dispensed in an 8 to 10 hour period. Thus with a reservoir of at least double this total the water level would not be dangerously lowered and would not be unsightly at any time.

If a running stream is to be used it may be necessary to install a dam. If this is done it would be wise to place the dam as far as possible down stream from the pump intake. This is necessary because silt will settle behind the dam. The pond will, therefore, become shallow. Silt and weeds may then clog the pumping equipment. A pond placed to the side of the main stream fed by pipe will keep the supply free from silt, see illustration, because silt will then

POND FED BY PIPES FROM STREAM



Wells as well as municipal water may be used to augment this type of supply.

wash down the stream and will not settle in the pond.

Water from Municipal Supply

This water as a rule is quite costly. It is often subject to special regulations. Many communities are growing so fast that water cannot be supplied in sufficient quantity, and sprinkling is banned to save water for sanitary purposes. Pressure during drought periods is usually very low. Thus we see how complex and important this problem is.

Obtain a Competent Engineer

Your engineer can help you in locating the source of water and in making decisions as to what type of water supply you should have. He will also advise on the type of system to be installed, hose system, hoseless or combination of the two.

Type of Irrigation System

The use of hose on fairways is about as obsolete as the horse and buggy and the steam locomotive. Hose systems require much more labor to operate and much more supervision. Connection of hose and placement of moveable sprinklers during the night when most of the watering must be done, is, to say the least, most difficult. It also requires much training of personnel. Here in the Northeast, this may never be fully accomplished as the period of heavy irrigation is rather short—12 to 18 weeks. It is difficult to obtain men for night watering and replacement is even more difficult. If any one is in doubt about such training just walk about your golf course some dark night and see how well you know the various locations of greens, tees, traps, bushes, etc. Therefore, anything that can be done to eliminate guesswork in the placement of water is of extreme importance.

It still will require much of the supervisor's time to check and control the amount of water to be applied; for whether members of the club realize it or not the control of water is one, if not the most, important phase of the production of good turf. It is fairly easy to control the amount and time of fertilization, fungicidal treatment and insecticides; however, to control moisture on the varying soil conditions found on most courses along with the changeable weather conditions, requires somewhat more than an exact science and not a little lost sleep.

It must be clear, therefore, that I recommend a system that will be as nearly hoseless as possible. Of course, there are some greens that will require special treatment; therefore, it should be possible to use hose whenever needed.

What Is Meant by a Hoseless System?

The generally accepted system is one with snap valves, equally spaced down the center of the fairway 75 to 100 feet apart. These start at the front edge of the green and extend towards the tee so that the fairway is watered to within 100 to 125 yards from the front of the tee. The green may be watered by a snap valve under a sod cup placed at its center or by spacing 3 valves equally around the edge of the green. The tees have snap valves or pop-up sprinkles through their centers. If it is necessary to use hose for any maintenance procedure it may be done by simply attaching a special coupling to any of the snap valves anywhere on the course.

This type of system will require a manually started pump with a capacity of 550 gallons per minute at 125 to 150 pounds pressure depending upon elevations. An auxiliary of 150 to 200 gallons per minute is also required. This pump will then supply sufficient water to irrigate the greens and tees. The pump may be operated automatically so that water will be available to any part of the course without the necessity of going to the pump house to turn on a pump. This also provides a safety factor should one pump be out of commission.

The foregoing information has been set forth to acquaint those interested in the problems involved in irrigating a golf course. This should also make clear the necessity of securing the services of a competent irrigation engineer. Most companies which manufacture irrigation equipment are in a position to furnish engineering service. They will be most happy to look over your layout and advise on the proper procedure.

What to Expect from an Engineer

1. Detailed scale plans and specifications for fairways, tees, greens and clubhouse piping system.
2. Detailed scale plans and specifications of a pumping plant if one is needed, including pump house building, pump, fittings, suction line, pumping sumps and screens.
3. Complete bill of materials for pipe, fittings, valves and pumping plant.
4. Detailed scale drawings of the method of installing snap valves and drains to piping system.
5. Complete bill of materials for irrigating equipment, snap valves and sizes, sprinklers and sizes. The complete plans and specifications are then presented to the committees who in turn may ask qualified contractors to bid on making the complete installation.

After the contract has been awarded it is the engineer's duty to:

6. Stake out the work on the grounds for the contractor.
7. Instruct the contractor regarding construction procedure.
8. Certify as to work completed by the contractor before the club issues scheduled payments.
9. Make final inspection and supervise the test of the system.
10. Instruct the club's staff in the operation of the system.

COMING EVENTS

August 6
US Department of Agriculture
Turf Field Day
Beltsville, Md.

August 8
Rutgers University Turf Field Day
Rutgers University
New Brunswick, N. J. — Dr. Ralph E. Engel

August 15-16
26th Annual Golf Course Superintendents Field Day
University of Rhode Island
Kingston, R. I. — Dr. J. A. DeFrance

September 10
St. Louis Field Day
Link's Nursery
Route 1, Conway Road
Clayton, Mo. — Leo S. Bauman

September 16-17
Midwest Regional Turf Foundation Field Days
Purdue University
Lafayette, Ind. — Dr. Wm. H. Daniel

October 16-17-18
Kansas State Turfgrass Conference
Kansas State College
Manhattan, Kans. — Dr. Ray A. Keen