Irrigation

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THERE are three methods of irrigation, namely, rainfall, hose systems and hoseless systems. Rainfall is naturally the most economical. It is also a fact that a small amount of nitrogen is supplied to the grass plants by every rain.

Irrigation by means of rainfall is usually sufficient to carry the turf from the first part of September up to the end of May. From the first of June to the end of August, we cannot depend on Nature. It is obvious then if we expect to keep the turf in a healthy condition, artificial irrigation must be resorted to. The hose system of irrigation has been practiced for years.

Up to about ten years ago, irrigation was used for greens and tees only. In those days, a greenkeeper was known by the condition of his greens; as far as that goes, he still is, but about ten years ago, progressive golf clubs felt they wanted more than perfect playing condition on their greens. They wanted perfect playing conditions also on their fairways.

JOHN MacGREGOR

The author of this story needs no introduction to our readers. He is a past master at greenkeeping and has originated many devices for the betterment of golf.

The club at which I am now employed was the first, I believe, in the Chicago District, to install a fairway irrigation system. It was the last word in irrigation at that time, and for a hose system, it still is satisfactory. I had no idea how I was going to operate the outfit. I considered it was just another thorn in what I considered my already full crown of thorns.

HOSE FAIRWAY SYSTEMS OF IRRIGATION

HOSE fairway systems are operated with different size hose from 1-inch to 2-inch, with sprinklers throwing from 15 to 90 gallons of water per minute. The 90-gallon per minute sprinkler and the 2-inch hose were the type of system we used. This system has been in use for 9 years for approximately two months every year. It is obvious, then, that irrigation is a necessity every year. You may use the system two weeks less this year, but next year you may find you have to use it four weeks longer.

My first year's experience with fairway irrigation, was a howling failure; there was plenty of water distributed, but the results far from gratifying. I had already figured my budget was going to be plenty high through this added item on maintenance, and was figuring on holding the expense down as much as possible. I had led myself to believe that the last Spring rain of account, was not the last one with the result that irrigation was started just about five days too late and the condition lasted through the whole season. I never did catch up with the condition.

NINE HOURS TO WATER ONE FAIRWAY

IT takes an average of nine hours to water one fairway, or, seven days to water the entire eighteen fairways, with a 24-hour-day operation. It is necessary then to start operations soon enough and never let a summer shower, be it of one or two hours' duration, interfere with your irrigation schedule, or grief will be yours.

When one talks of irrigation, it is well to remember that enough water must be supplied the turf to keep it in a healthy condition for eight days. Soil and climatic conditions may alter this from four to ten days. A watering which penetrates from 2½ to 3 inches into the soil is enough under

ordinary conditions to keep the turf in good condition for seven days.

The fact that you have installed a water or irrigation system does not mean that the turf should be drenched continually, giving the player the most unfair lies—in not on a soggy turf. Do not over-water. Give the turf the amount of moisture it requires, never an excess. Water-logging, through excess moisture is surely in store for those who practice excessive watering. This condition is not so easily remedied either.

On the other hand, we have the other extreme; the man who persists in sprinkling, that is, moistening the soil to a depth of about ¼-inch. This method, naturally, of course, brings the feeding roots close to the surface in search of the moisture, where the hot sun just naturally burns those fine roots up. Every successive sprinkling is naturally more and more sapping the life of the plant. Turf treated in this way does not respond quickly to treatment for recovery.

DRAINAGE IS MOST IMPORTANT

For those contemplating irrigation systems, their first thought should be adequate drainage; without it, irrigation will be a failure, unless you have a sandy sub-soil. There must be an outlet for the excess water or a soggy water-logged condition will be the result. It is necessary that the soil be porous to allow air and moisture to penetrate.

Soggy conditions are aggravated through the necessary mowing of the fairways. The continual rolling with even the lightest mowing equipment, eventually gives you a sealed top soil, excluding all air, thus resulting in unhealthy turf.

The next factor is an adequate water supply. The mains must be large enough to maintain equal pressure at all points of the system. Up-to-date hose systems including the water supply and pumping plant will cost between $20,000 and $60,000 to install, depending on local conditions. The lower-priced systems, of course, are those where conditions have made it possible to reduce the cost through natural water supply, or, where booster pumps are used instead of elevated or underground tanks, and where installation of the piping is on or near the surface of the ground.

The higher-priced systems are where the piping is laid below the frost line, necessitating the

opening and filling of ditches; the erection of an elevated tank or the burying of pressure tanks; the construction of reservoir; or building of lakes; the drilling of deep wells; installation of pumping equipment and erection of pump houses.

My idea of a well-built and installed hose system, would be a 6-inch loop main of cast-iron pipe with caulked joints; four-inch laterals, also of cast-iron; leads to greens, tees and fairway outlets of 2-inch galvanized pipe. These sizes will assure an equal pressure at all points. The piping should be placed below the frost line. An elevated tank should be at least 130 feet high and of not less than 100,000 gallons capacity, preferably 200,000. If water supply is direct from wells, pumps of not less than 500 gallons a minute capacity should be installed; the water to be pumped into a lake, with a capacity of 4,000,000 gallons.

AMOUNT OF WATER USED PER DAY

THE amount of water used per day on an 18-hole course is between 25,000 and 500,000 gallons—for the average season between 2,250,000 and 45,000,000 gallons. It is obvious then that an adequate water supply is necessary. Intelligent operation of the hose system is just as necessary as the system itself.

The third and last method of irrigation is the hoseless or pop-up system. They are practically new in the East and Middle West, but, have been in successful operation on the California courses for several years. If Joe Mayo was here, he would tell you the hoseless system solved the irrigation problems on the coast. I will venture to say they will very soon solve our irrigation problems here.

Everything is in favor of the adoption of the hoseless system here. They have now been developed to a high point of efficiency; the experimental period is over; in fact the installation cost is now about the same as for a hose system.

The points in favor of a hoseless system are: The saving on hose and sprinkler purchasing; the saving on labor, and uniform coverage of the entire course, while with the hose system, much over-lapping is bound to result during the night.

POP UP IS ONE-MAN SYSTEM

The pop-up system is a one-man system. One valve controls one or more fairways, depending on the volume of water available. This means the system would not be in daily use during dry periods.

It will be so much easier to regulate the amount of water the turf requires, especially for green sprinkling. Think what that means in a more thorough control of the moisture supply during humid brown patch weather; also during the dormant or resting season of the turf.

The cost of changing an up-to-date hose system to a hoseless would not, I will venture to say, be more than the cost of a five-year hose supply and labor cost. I am for this system because it will reduce costs and maintain high standards of maintenance, and would advise those contemplating new irrigation systems to go into the hoseless systems thoroughly, and be sure when you have chosen, that is the one best adapted to your requirements.

Look well—before you decide.

One more important matter in this irrigation system problem comes to my mind. I say *important,* advisedly—this is the matter of a ground plan —a plan of the entire irrigation system, showing valves, shut-offs, drains, etc. *This plan to be framed and hung in the pump-house in plain view.*