

USE YOUR WATERING SYSTEM RIGHT

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*Thorough understanding needed
of turf's water requirements*

THE golf course which has invested in a watering system costing several thousand dollars for installation, in addition to the annual cost of water, frequently discovers that the problems of fairway maintenance are still serious and even critical. All too often the turf is composed largely of *Poa annua*, clover, and crab grass, and it is subject to periodic disease attacks.

The question naturally arises as to whether fairway watering systems pay for themselves in improved quality of turf, and whether the difficulties are due to the watering system or are caused by other factors. It is discouraging to the green-committee, to the engineers who provide the technical information on the new watering system, and particularly to the average player, to find that an unsatisfactory turf may still exist in spite of the expense borne by the club.

Understanding of Water System Necessary

All of the ills which occur on the fairways should not be attributed to the watering system after its installation. Neither should all the imperfections in fairways be blamed on other phases of management of the course. Usually the difficulties can be overcome and excellent turf produced with the aid of this liberal supply of water. What is required is a thorough understanding of the place which water fills in growing turf and of the other necessary requirements for growth.

Courses which have no fairway watering system may well pause to consider the necessity for this improvement prior to making the actual investment. Under some conditions it may be adequate to improve soil conditions and change slightly the treatment of the turf in order to make full use of the annual rainfall. Healthy grasses growing on properly treated soils are not injured to any extent by droughts of short duration. Even though the turf becomes quite brown in dry periods during summer, there will be no permanent injury to the turf unless the drought persists for several weeks. The turf merely becomes dormant during the dry period and renews growth when conditions be-

come favorable. On the other hand, the excessive use of water which produces a water-logged condition of the soil, results in suffocation of the roots, and their death produces injury which can hardly be corrected until the following spring when a new growth of roots takes place.

Heavily watered fairways were more seriously injured by the continued heavy rains which occurred recently in some parts of the country than fairways on which no artificial watering was practiced. Since it is difficult if not virtually impossible to predict the occurrence of heavy rains, it is well, from the standpoint of health of the turf, to depend on artificial watering as little as possible during the growing season. The actual water requirement of turf will vary with the temperature, the water capacity of the soil, the depth of the root system, and the prevalence of winds. In hot weather, moisture is dissipated much more rapidly as a result of the evaporation of water from the soil and the loss of water by transpiration from the grass leaves.

Obviously, soils which have low water holding capacity will be unable to supply moisture for any considerable time when rainfall is scanty. This is particularly true where the root system is very limited, either due to faulty management or to soil conditions which restrict root growth. Strong soil acidity, the lack of sufficient phosphates in the soil, and continued close mowing are the principal factors which may be responsible for scanty root growth. The proper use of lime, the liberal use of complete fertilizer contain-

Dixwell Davenport, San Francisco GC green-chairman, said a bookful when he reflected: "A lot of us will spend an hour looking for a lost ball but won't give a second of our time for a lost caddie." That's a remark that ought to appear on the bulletin boards of many clubs, just as a reminder.



A fairway watering system is not for every-day use; rather, it serves as insurance against baked turf during protracted dry spells.

ing phosphates as well as the other elements, and maintaining a height of cut of at least one inch, are very effective means of increasing root depth and developing a vigorous turf capable of enduring droughts without serious injury. Even though such turf becomes brown in dry periods, there will be sufficient grass present to provide a playing surface for a considerable time after growth ceases. Healthy turf resumes growth promptly when moisture again becomes available.

Don't Force Turf in Hot Weather

A harmful practice which frequently follows the installation of a fairway watering system is the forcing of grass with continued watering, in periods of very warm weather. Growth made under these conditions is not only succulent, easily injured by diseases and the normal wear which a golf course receives, but this growth is made at the expense of the food reserves of the plant. Continued forcing merely means exhaustion of the permanent grass and stimulation of the summer weeds which thrive under such treatment.

Good judgment is needed in the use of a watering system. One of the best means of determining whether turf actually re-

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The law hasn't any more control than has a golfer, over the slice of a golf ball. So ruled Louisville (Ky.) Circuit Judge Churchill Humphrey in denying an injunction against members of the Audubon CC using its No. 4 tee. Property-owner whose yard is about 225 yards from the tee exhibited 51 golf balls sliced onto his lawn in about 2½ months.

quires water is to examine the soil throughout the depth occupied by the roots. If the soil is perceptibly moist, water is not needed and should not be applied. When the soil becomes very dry, water should then be used in sufficient quantities to moisten the soil to a depth of at least 3 or 4 inches. The actual amount of water required will, of course, vary with the kind of soil and its water holding capacity. Light surface waterings must be avoided to prevent undue stimulation of crab grass which thrives under such treatment. Excessively heavy waterings should be avoided to prevent the water-logging which would be inevitable in case a heavy rain should follow soon after the watering. The use of a spade, soil auger, soil tube, or some similar soil sampling device, is helpful in making soil examinations to determine the water requirements. It is not necessary to examine all portions of the fairways. Usually 2 or 3 typical areas will serve as a reliable index of the need of the fairways as a whole.

Acid Soil Will Hold Less Moisture

In certain critical experiments on the water relations of soil types conducted at the N. J. Agricultural Experiment Station, it was shown that soils which had been allowed to become acid or which were naturally acid, had a very limited ability to take in moisture received in heavy rains or in artificial watering. The poor permeability of such soils indicates they suffer from drought because of the large losses by run-off of water.

When the acidity is corrected by the proper use of lime, the permeability is greatly improved and usually the water holding capacity is likewise improved, with the result that much more efficient use of annual rainfall is obtained. Obviously, if drought on golf courses is the result of poor soil conditions, it will be desirable to correct these by the appropriate means rather than to supply still more water.

It should, of course, be noted that the type of soil and the normal rainfall of the region must both be considered in determining whether a fairway watering system is necessary. Even in humid regions, golf courses located on very sandy soils or very shaley soils may require supplemental water. The same may be said for courses located on very tight soils where root penetration is certain to be limited. On the latter soil type, however, great improvement is sometimes obtained from the installation of a proper system of tile drainage.

In most cases, it is found that some artificial drainage becomes imperative when a fairway watering system is installed. Areas that do not become waterlogged under natural rainfall, are imperfectly drained when natural rainfall is supplemented with a watering system.

A Great Asset If Used Right

It is a fair statement to make that even in humid climates, a fairway watering system is a great asset to the course if properly used. The problem of proper use of a watering system must be worked out intelligently. Not only is there a need for thorough understanding of the part water plays in producing turf, but there must also be the necessary power vested in those managing the course to apply moisture in an intelligent fashion. Influential players not familiar with turf production problems, frequently complain of unsatisfactory fairways and insist on the use of additional water, and thus are responsible for great injuries to the turf.

It must be clearly understood that water is not a substitute for lime, nor does it take the place of commercial fertilizer. Rather, the increased use of water means a definite need for additional amounts of these elements to balance the greater losses produced by leaching and by run-off.

Another critical factor which must be

Fifth annual Hartford (Conn.) District Progressive Tournament will be held October 23, tournament officials have announced. The event is called 'progressive golf' because 2 holes are played on each of 9 different courses, making a full 18 holes in all. The tournament will end with a dinner that evening at the Hartford G.C.

The total scores of the eight members of each team determine the winner. The winning team will be permitted first choice of the donated prizes, of which each team has donated eight and which cost not less than \$1.00 each.

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recognized is the effect of close mowing. Close mowing which usually follows the installation of a watering system will reduce the vigor of the permanent grasses and permit the invasion of the sod by crab grass, clover and annual bluegrass. Since none of these weeds provide permanently satisfactory playing turf, it is obvious that the height of mowing must be kept above an inch to prevent their entrance. Although it may be possible to maintain a green sod at mowing lengths shorter than one inch by use of watering systems, the type of turf will be inferior.

Don't Cut Grass Too Short

It is a fatal move to attempt maintenance of fairways at short lengths merely due to the fact that water is available, even where weeds do not become the predominant type of vegetation. The permanent grasses which can survive close mowing are very susceptible to disease, and fairways of such grasses may literally disappear in critical periods because of disease epidemics. With longer length of mowing, permanent grasses not susceptible to disease will make up the majority of the vegetation and the disease hazard will be reduced to a minimum.

Golf courses which lack financial resources for fairway watering systems may take consolation from the fact that good turf usually may be established by proper use of lime and fertilizers and the addition of seed of permanent grasses on thin areas after the soil has been improved. In some instances it may be necessary to run temporary water lines to critical areas in order to re-establish turf. However, when sod has been produced which is cut regularly at lengths greater than one inch, natural rainfall will become much more effective. Such thick sod not only reduces greatly the loss of water by run-off but it also insures the use of soil moisture by

plants rather than by direct evaporation from the soil.

The longer cut turf will also provide a playable surface in dry periods long after actual growth of grass has ceased. Given reasonably good soils, properly treated, and with proper management of the turf, quite a few golf courses in areas that have 30 inches or more of rainfall annually should be able to provide good

playing conditions during the greater part of the year without incurring the expense of a complete fairway watering system. Under conditions of very heavy play, however, or on soils with low water capacity, some sort of watering system is a necessity. On such courses the need for intelligent management is thereby increased in order to derive the maximum return from the investment a watering system involves.

HOW TO RECONDITION GREENS

EVERY year GOLFDOM receives many requests from clubs wanting information on improving greens that have been permitted to get into bad shape, and how to improve them cheaply and quickly so play will be interfered with as little as possible. Some greens at these clubs have been allowed to go from bad to worse, and it's evident something must be done soon, yet the clubs lack the money it would take to build new greens or rebuild the old. Chester Mendenhall, greenkeeper at the Mission Hills CC in the Kansas City district, has some comments on just this situation and how he worked it out at his club. He says:

Too many greens have been built with only one thought in mind—"getting them in play"—therefore, very little thought has been given to soil structure or the future of the green. After a green is in play any change in the physical condition of the soil, without stripping off the sod and resurfacing the green, is a long drawn out process. However, a green can be greatly improved over a period of two or three years, if the work is systematically done.

Poor soil condition in the top few inches of the green surface is not always due to improper soil structure. In a good many cases it is due to improper preparation of the topdressing. Layers of sand, peat and other materials are formed. In my opinion, these layers of sand or peat cause more trouble than poor preparation of soil at the time of building the green. Often root growth is checked at such layers, leaving a very shallow root growth, which will require very frequent watering during hot, dry periods.

We have had very satisfactory results improving such greens by forking and

working well-mixed topdressing down from the top. Of course, this is slow and it takes some time to greatly improve a green. My best luck has been to fork such greens the latter part of February.

We use a fork made out of pipe and a ½-in. rod. There are 10 tines placed 3 in. apart through a piece of 1¼ in. pipe. A piece of 1-in. pipe is welded in the center for a handle. The tines are made of ½-in. rod about 7 in. long, flattened a little and drawn to a point. We fork the greens with holes 4 in. apart.

The fork is pushed away from the man and pulled back to make the holes about one in. long at the top. The green is then mowed very close, to level the dirt that has been pushed up around the holes. This is done to let the topdressing down into the holes.

The green is then heavily topdressed, and is matted several times to get as much down the holes as possible. It is matted each day, and if the holes are not all full the green is again topdressed. The play is taken off the green until the grass begins to come through.

This process also helps build up your green with the proper mixture. The more topdressing you can get on a green in this condition, the better; also, each time a green is forked we change the direction in which it is forked. For example, if a green is forked from front to back the first time, the next time it is forked from side to side.

We make a regular practice of giving all our greens this treatment once each spring, and find it pays well. Some of our greens are badly layered with sand and peat and before we started regular spring forking we lost turf every summer.