



Better Turf for Better Golf

# TURF MANAGEMENT

from the USGA Green Section

## *Water Use On The Golf Course*

The USGA Green Section conducted its fourth annual Educational Program at the Biltmore Hotel, New York, January 29, 1960. The Chairman was William C. Chapin, Chairman of the USGA Green Section Committee. The Vice-Chairman was Edwin Hoyt, Northeastern District Chairman of the USGA Green Section Committee.

Moderators were Alexander M. Radkc, Eastern Director, USGA Green Section, and William H. Bengueyfield, Western Director, USGA Green Section. Also participating were James L. Holmes, Mid-Western Agronomist, USGA Green Section, and Charles K. Hallowell, Mid-Atlantic Director, USGA Green Section.

The morning session was devoted to the topic, "The Mechanics of Applying Water."

The afternoon session was devoted to the topic, "Water Requirements of the Golf Course." The talks will be summarized in the June issue of the USGA Journal and Turf Management.

The following papers summarize talks delivered during the morning session.

### *Introduction*

By ALEXANDER M. RADKO  
Eastern Director, USGA Green Section

Recently we came across a reference to some startling information in the "Water Newsletter." It reports that "the National Cash Register Company has been successful in producing powdered water for industrial use and now moves the reference to powdered water from the level of a TV and radio joke to the real thing. The powder is manufactured by coating tiny particles of water with gelatin. Although dry to the touch, the powder can easily be crushed or dissolved to a liquid state. The producer is adapting the technique to coat bank deposit slips and other forms—so that carbon copies may be made without the use of carbon paper."

It is not beyond the realm of possibility, therefore, that some day we may be watering our golf courses with powdered water in the same manner that we now apply limestone, fertilizer, insecticides, or other dry materials. This would be truly efficient use of water—treating only those areas that need it in the exact quantities desired. This, however, is projecting far beyond the realm of this discussion. We are concerned here with the use of water in the liquid state, as we know it, and its use on the golf course.

What are the requirements for your course and how do you go about determining this factor? The first logical step is to check the rainfall records for your

locale. These can be obtained from your local Weather Bureau. New York City, for example, in its 75 years history, reports that the average rainfall for the 22-week period from April 1 through September 30 was 18.53 inches. Based on the "rule of thumb" assumption that grasses normally require one inch of water per week, theoretically, to span this critical 22-week period, we need only to supplement with 3.47 inches of artificial water to satisfy our requirement. Actually, because of the usual erratic distribution of rainfall, we should allow for at least double this amount, according to most irrigation specialists, in order to be on the safe side.

What does this mean in gallons? The average golf course has approximately 45 acres in fairways. It takes approximately 1¼ million gallons to provide one acre inch of water to 45 acres. To satisfy our requirement of applying 3.47 inches it would take approximately 4½ million gal-

lons of water. To be on the safe side, therefore, it would be necessary to have approximately 8½ million gallons of water for irrigation purposes for an average golf course in or around the New York Metropolitan Area. This is the average situation; actually, there are courses in this area that use less water yearly, and there are courses that use more. From Weather Bureau records available each of us could work out the requirement for any specific area in the nation.

Water is one of our most precious natural resources. With the increase in population and growing industrial uses, there is growing concern that as a nation we are running out of water, and many states are closely re-examining their water policies with an eye toward new and adequate legislation on this problem. There is no room for water waste as a nation, nor is there room for waste on the golf course.

## Water Distribution Systems

By E. R. STEINIGER

Member, USGA Green Section Committee, and Golf Course Superintendent, Pine Valley Golf Club, Pine Valley, N. J.

**F**undamentals and standards have been developed for water distribution systems. However, the application of these standards will vary with the use made of the systems. For turf development and maintenance this variation is obvious. Differences in soil, terrain, type of grasses grown, degree of maintenance, all affect the system used. The watering practice for any course must be adapted to meet local conditions, otherwise the watering system can become a liability instead of an asset.

Several items will be covered by my remarks on our experience with water systems at Pine Valley.

Many of you know that our course is built on very sandy soil. Without an adequate supply of water it would be impossible to produce good golfing turf. Fortunately, we are blessed with an abundant supply of good water at all times. This water comes from several spring-fed lakes on the course.

In 1912 when our first holes were built, a temporary water system was installed. The water was supplied from three lakes at different locations on the course. The

power for the chain-driven pumps came from huge water wheels. The water wheels in turn got their power from the overflow of the dams. Two of the old water wheels are still on the course—just for rustic effect.

In 1920 when the course was completed, a permanent watering system for fairways and greens was installed. (As a matter of fact, this layout was the most up-to-date system at that time.) In this system all the mains ran parallel to the fairways with hose outlets, spaced every 80 feet, located in sunken wooden boxes flush with the ground. There were over 300 outlets of this type, and 25,000 feet of hose was needed to water the course. This system held up well for nearly 40 years. Although it offered much flexibility in that you could put the water where it was needed and in the quantities needed, it did have many limitations. The pressure loss was great. A system of this type requires 150 to 200 feet of hose from outlet to edge of fairway, and it is interesting to note that a sprinkler producing 10 gallons per minute, traveling through ¾ inch water hose will lose 14 pounds of pressure for each 100 feet traveled.