

The Role of Water in Plant Growth

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Water is the most abundant material in a growing plant, usually comprising 80% or more of the plant weight, but in the plant's environment water is never found in a pure state. The essentiality of water for many plant functions and properties is beyond question.

It is a solvent for mineral nutrients and the complex substances manufactured within the plant.

It is a means of transportation for food materials and the medium in which these products move from one plant part to another.

Water is the source of the hydrogen which is combined with carbon and oxygen from the air to form carbohydrates by the process of photosynthesis. Photosynthesis is believed to be the underlying process which supports all life.

Evaporation of water from leaf surfaces provides refrigeration or temperature control for the plant.

Water may even be considered a structural agent. Plant cells containing an abundance of water are turgid and the plant stands erect. When there is a water deficit the cells are flaccid and the plant droops or wilts. This principle can be demonstrated with a toy balloon. Inflated fully, it will support a considerable weight. When only partially inflated it will support practically nothing. Many

observers have noted that wilting turf suffers much greater damage from traffic than does well watered turf.

There are a great many anatomical and morphological plant modifications that determine a plant's ability to survive in a given environment with respect to water. These same modifications dictate to a considerable extent the management practices that must be followed.

The depth and form of a root system have a great deal to do with the behavior of plants in conditions of too much or too little moisture. The biochemical and biophysical characteristics of plants differs to such an extent that rice can grow in standing water while most other plants cannot, and the members of the cactus family can maintain water in their tissues even in severed parts under extremely hot and dry conditions.

Leaves of grass display many interesting anatomical differences that are correlated with the environmental conditions in which the grasses are found.

The grower of plants should learn as much as possible about the species with which he deals with respect to its water needs.

NOTE: This topic is discussed more fully in the November 1959 issue of the USGA Journal.

Water Requirements of the Golf Course

The Golfer's Point of View

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There are many varying opinions among golfers as to their likes and dislikes in the preparation of a golf course for tournament play. It is my opinion that with the exception of lightning-fast greens, the member who supports the Golf Club should enjoy the same well-groomed golf course that the professionals and top amateurs enjoy when teeing off in an important championship. Let us, therefore, begin with an imaginary round of golf at an imaginary golf course with you as my guest.

As we arrive at the first tee, I will impress you with the tee alignment. It is facing straight down the middle of the fairway, not toward the dreadful out-of-bounds on the left nor the timber laden rough on the right. The teeing area is clean, level and well-trimmed. It is watered but moderately dry. You will have no problem in selecting a choice spot for your initial drive. The markers are squarely set. The area is level, and the tee itself will not give you the impression of a down-hill or up-hill lie. The