



## Turfgrass Series Watering for residential lawns

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Turfgrasses on Guam are able to use from 1 to 2 inches of water per week, depending upon species, location, and weather conditions. Even though the total yearly precipitation is abundant, its seasonal distribution is unsatisfactory to maintain a dense, green turf of good quality year-round.

In general, the water required by growing turf may originate from rainfall, irrigation, or a combination of the two. By far, the most important factor that determines the plant's need for water is **evapotranspiration**. This term combines the words **evaporation**, which is water loss from a surface, and **transpiration**, which entails water loss from the plant. For turf, where the soil is usually completely covered by growing leaves and stems, most of the water loss is due to transpiration. Water enters turfgrass through the roots and exits through microscopic openings in the leaf blades called **stomata**. Stomata can open and close in response to changing humidity, temperature, and wind. During the dry season when humidity is lower and days are usually windy, turf uses more water than can be stored in the soil.

### When to water

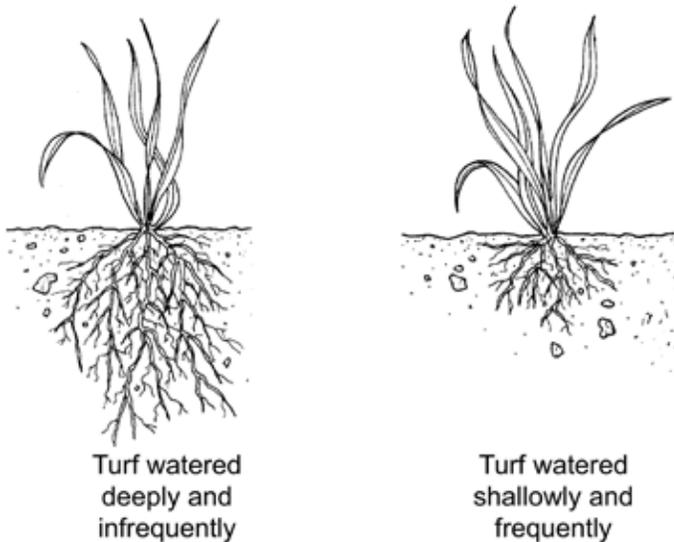
It is best to irrigate somewhat prior to water stress. Water stress occurs when the rate of water loss through evapotranspiration exceeds the rate of absorption through the root system. Short-lasting moderate stress is not detrimental. The only critical demand is that water is applied before permanent wilting of turf occurs causing serious injury and long-lasting damage. For most turfgrasses the color is a good indicator of stress and need for irrigation. Water-stressed patches of turf turn bluish green and can be easily distinguished from areas that have not yet undergone lack-of-water stress. In addition to

color change, centipedegrass and St. Augustinegrass can be tested for water stress by walking on the turf and observing the visibility of foot prints on the turf canopy. If turf is not water-stressed, leaves return to their upright position within several minutes after walking on it. If it is stressed, wilted leaves take 20 minutes or more. Another method is to observe the leaves. Water-stressed leaves roll or fold to conserve moisture. When a considerable number of leaves show these conditions, turf should be irrigated as soon as possible.

### How frequently should you water?

The first principle of irrigation management is: "deep and infrequent". At each irrigation event, soil capillaries in the entire root zone should be filled with water and then gradually depleted to the point at which turfgrass approaches water stress. Excessive irrigation frequency is detrimental because it results in the development of shallow root systems (Figure 1). Soil usually dries from the surface, remaining moist at greater depth. Roots seek water where it can be found and therefore elongate to greater depths, often to 2 ft or even more. Turfgrasses with deep roots perform much better overall and are more resistant to water stress.

The majority of soils on Guam (except shallow soils over corral) should be irrigated with about ½ inch of water every 3-4 days. The "deep and infrequent" rule must be modified on newly established areas where irrigation could be needed several times a day. Therefore, without a good irrigation system the establishment of lawns should be avoided during dry season.



**Figure 1. Excessively frequent irrigation results in shallow root systems.**

### Irrigation methods

The overwhelming majority of residential lawns are irrigated overhead. Water is distributed through an irrigation system, either pipes or garden hoses, and sprayed by a sprinkler head. The purpose of a sprinkler head is to disperse water into fine droplets that fall uniformly on the turf surface, as would a light rain. A broad variety of sprinkler heads is available on the market. Some are designed for irrigating large areas, and some for small areas such as home lawns. They vary greatly in size, design, efficiency, methods of spraying water, and can be classified as either rotary or fixed. Rotary sprinkler heads shoot water as one or more streams of spray. Water flowing through the sprinkler head makes it rotate to cover a circular area or a set portion of a circle. An important consideration is that during sprinkler head rotation, much more water per unit area falls closer to the sprinkler than to areas farther away. Therefore, adjacent heads should be properly spaced, so their overlapping pattern can provide relatively uniform coverage.

Fixed sprinkler heads have no moving parts and are often used to water home lawns, flower-beds, and other landscape plants. Each produces a fine spray of water covering a relatively small area of full, half and

quarter circles. Popular adjustable heads can water any part of a circle, from 0° to about 360°.

Another popular type used by home-owners is an oscillating sprinkler, also called a wave sprinkler. Water from a garden hose is delivered through a row of small nozzles (holes) in a bent pipe. The pipe turns slowly back and forth, sweeping rows of small streams of water back and forth across the area to be watered.



**Figure 2. Fixed sprinklers produce a fine spray covering a small area.**

### Tips for water conservation

Before an expected drought, keep mowing the turf a little higher than usual. More leaves promote the growth of deeper roots and increase drought resistance. To help retain moisture in your lawn, do not remove clippings. They serve as a barrier that slows evaporation, preventing the roots from drying out too fast.

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