

When using any predictive equation to determine ET rates or net irrigation requirements to maintain grass, a series of assumptions must be made. These assumptions influence actual amounts of net irrigation requirements since each location and golf operation is designed and built differently. Allowances are needed to account for these and to adjust for any differences.

1. Net irrigation requirement is affected by irrigation system efficiency. For example, if 1.0 inch water is needed with a 75% efficient system, then 1.33 (1.0+0.75) inches of total "applied" water is required to uniformly apply this 1.0 inch.
2. Environmental parameters at the time of application also influence the amount of water gallonage usable by plants. Applications made during hot temperature, windy conditions, and when relative humidity is low as well as with finer mist irrigation nozzles can result in evaporation before reaching the plants. Irrigation should not be scheduled during such periods. However, special practices such as establishing new turf areas and watering in fertilizer or pesticide applications, often necessitate irrigation during adverse conditions.
3. Net irrigation requirements listed are for taller mowed grass. Closely maintained grass such as greens and tees have significantly less rooting depth compared to taller mowed plants, thus requiring more frequent, shallow irrigations.
4. Rainfall amounts used in these calculations are averages based on historical climatological data. Deviations from these averages usually occur and net irrigation amounts during exceptionally dry years will have to be increased to compensate for

this. Values listed also assume even rainfall distribution over the entire period. If uniform rainfall distribution does not occur, irrigation amounts higher than those listed in Tables 3-11 are required.

5. "On-site" computer assisted ET predicted models calculate water needs based on local conditions. Generally, a range of ET models is used and they estimate between 0.8 and 1.2 of actual ET.

### Irrigation Strategies for Turfgrass Managers

In light of previously discussed topics, strategies for irrigating golf courses involve calibrating the irrigation system to determine its output per hour; determining when to irrigate; and, knowing appropriate application rates.

### Calibrating an Irrigation System

Calibrating an irrigation system can be achieved by several means. One is to measure the gallonage of water flowing through the system and, with information on the area covered, an approximate amount applied in a given period of time can be determined.

A direct and simple method is to randomly place containers of the same size (e.g., coffee cans) throughout each irrigation zone, run the system for a set amount of time, and then measure depth of water in each container. These amounts are then averaged and multiplied to provide inches of water applied per hour. For example, if an average of ¼ inch of water is caught in 15 minutes, the irrigation system delivers 1.0 inch of water per hour:

$$\frac{\text{av. inches caught}}{\text{per 15 minutes}} \times \frac{60 \text{ minutes}}{\text{hour}} = \text{inches of water applied per hour}$$

Table 12. Conversions for determining turfgrass irrigation needs.

1 acre-inch (amount of water needed to cover 1 acre to the depth of 1 inch)	=	27,154 gal or 43,560 cu in or 3,630 cu ft	1 acre-foot (amount of water needed to cover 1 acre to the depth of 1 foot)	=	325,851 gal or 43,560 cu ft
1 inch/1000 sq ft	=	620 gal or 83 cu ft	7.5 gallons	=	1 cu ft or 231 cu in
1 gallon	=	0.134 cu ft = 8.34 lbs	1 million gallons	=	3.07 acre-feet
1 pound of water	=	0.1199 gal			