

## Estimating Irrigation Needs for Turf

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Water management is one of the most important practices in providing a quality, stress tolerant turf. Too little or too much water can result in a wide range of turf problems and maintenance difficulties. A key aspect of integrated pest management for disease, insect or weed problems involves management of irrigation.

The amount of water used by turf (evapotranspiration) is influenced by:

- 1) solar radiation (sunlight intensity and day length);
- 2) relative humidity;
- 3) temperature;
- 4) wind speed; and
- 5) the amount of water in the soil.

During the growing season evapotranspiration (ET) rates vary from almost none on humid, cloudy, cool, rainy days to nearly .3 inch under bright, sunny, low humidity, windy conditions during the long days of early summer. On a typical day in June or July .15 to .18 inch of ET is used by cool season grasses in Michigan. Fine fescues tend to have the lowest water use rates while some of the faster growing tall fescues have higher rates due to faster leaf extension rates. However, there is almost as much variation among cultivars as there is among species.

Other things that affect ET include shade, soil texture, rooting depth, and angle of slope exposure. Research has shown that turf can be maintained with about 80% of the maximum water lost from an evaporation pan. By contrast, a landscape with trees, shrubs, and ground cover can use up to 120% of open pan evaporation, up to 50% more than turf alone because of much higher leaf surface area.

Design of the irrigation system for home lawns and ground can pose a challenge for design specialists due to variations in shade, soil, slope, and unusual shapes of landscape areas. Of particular concern are the difficulty in providing uniform distribution and determination of the precipitation rate. How can one irrigate properly without knowledge of this information?

Irrigation design specialists can provide an estimate of the precipitation rate but for best planning calibration of the system is advised. This can be accomplished using a series of glass or plastic tubes placed on a grid basis over the area concerned. Permit the irrigation system to run for an extended time (one hour or more). Measure the depth of water in each tube using a ruler with a scale in millimeters or tenths of inches. Divide the inch(es) of water by the minutes of irrigation, giving the amount of water delivered per minute. One can then determine how many minutes are needed to deliver the amount of water desired (-1 inch, for example). Precipitation rates can vary from as low as about .2 to nearly .5 inch per hour.

Because many landscape irrigation systems are controlled by a clock, they operate whether it is raining or not. The turf industry is often criticized for this. Installation of a rain override is strongly recommended. Despite moderate cost, rain override devices are seldom utilized on home lawns as well as for other landscapes.