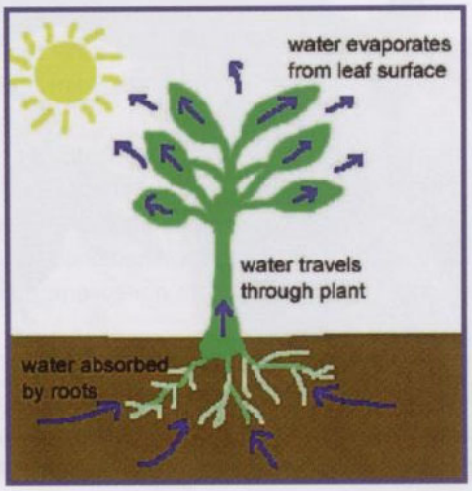
IRRIGATION

Irrigation is essential for the maintenance of turf on the Swan Coastal Plain due to the strongly seasonal rainfall pattern and high evaporative conditions during summer. About 80% of the annual rainfall occurs between May and September. The average rainfall for the seven months between October and April is only 175 mm, while evaporation for the same period is 1650 mm. Turf needs to be irrigated during this period to maintain an acceptable standard for use.

PLANT WATER USE

Turf needs water for its growth and development. Water enters the plant through the fine root hairs, which are located near the root tips. Water moves upwards through the plant to the leaves, where it is vapourised and lost to the atmosphere.



Only a small amount of the water that is taken up is actually used for plant growth. More than 90% of the water taken up is used for cooling the plant by absorbing heat in the evaporation process. This loss of water vapour from the leaves is known as *transpiration*, which is controlled by the opening and closing of tiny pores in the leaves called stomata.

Daily water use pattern

Water uptake is also controlled by the opening and closing of stomata in the leaf, which is triggered by light. Stomata are closed at night when there is no photosynthesis, and open up in the morning as light levels increase. Stomatal opening allows the plant to draw in carbon dioxide that is used in photosynthesis, but it also allows water to escape from the leaves.

Stomata stay open all day and close rapidly as light levels fall in the evening. Therefore, turf water use during the night is negligible and water applied overnight is not taken up until the following morning.

Water use rate

The rate of water used by turf varies with species, cultural practices and weather conditions, such as solar radiation, wind, temperature and relative humidity. Warm season grasses (couch and kikuyu), have significantly lower maximum rates of water use than cool season grasses (tall fescue and ryegrass).