

Landscape irrigation water requirements

Landscape plants are generally grouped into three water use categories: low (25-50 cm/year), medium (50-87 cm/year, and high (87-125 cm/year). (Desai, 1981).

The City of Tucson has further divided the low water use plant list into four categories.

1. No supplemental irrigation once established.
2. Irrigate once a month during the growing season once established.
3. Irrigate twice a month during the growing season once established.
4. Irrigate once a week during the growing season once established.

The list of low water use plants is available at

<http://www.water.az.gov/adwr/Content/Conservation/LowWaterPlantLists/TucsonAMA/Files/DesertGuideTUC.pdf>

In one study, four species of trees, shrubs, and ground covers, commonly used in landscape designs in Southern Arizona were given high medium and low water treatments under trickle and spray irrigation systems (Desai, 1981). The measurements from the dissertation were used to calculate ET rates.

Plants were planted during summer 1978. During the first year summer (1979), plants were irrigated based on soil moisture. There were three treatments (high, medium, and low water). However, all plants received adequate water, and there was no difference in plant growth between the three treatments (desert plants do not become stressed until soil moisture is below the range of the soil moisture sensors used in the experiment). During the second year summer (1980), plants were irrigated when the medium water treatment began to have yellowing of the leaves. Plant dimensions along with application depths per day to the medium treatment are shown in table 2.

Table 2. Plants used in Desai's experiment along with ET rates during June, July and August 1980. Low water use plant number in right column.

Common name	Scientific name	D (ft)	Ht (ft)	GPD	ET (in/day)	ET w/ precip	LW #
Acacia	Acacia smallii	7	8.3	0.21	0.042	0.089	2
Boxwood	Buxus microphylla	1	1.3	0.23	2.043	2.090	n/a
Eunomys	Eunomys japonica	2.2	3.1	0.51	0.422	0.469	n/a
Buford's holly	Ilex cornuta "Bufordii"	1	1.3	0.3	2.043	2.090	n/a
Texas Ranger	Leucophyllum frutescens	5.1	4	0.53	0.079	0.126	2
Privet	Ligustrum lucidum	6.3	5.5	0.73	0.051	0.098	n/a

Mulberry	Morus alba	12.6	12.1	0.87	0.013	0.060	n/a
Oleander	Nerium oleander	6.9	5.2	0.45	0.043	0.090	2
Pine	Pinus eldarica	4.5	7.7	0.2	0.101	0.148	2
Mesquite	Prosopis glandulosa	4	5	0.45	0.128	0.175	2
Pyracantha	Pyracantha	6.1	3	0.48	0.055	0.102	3
African sumac	Rhus lancia	4.4	5.3	0.48	0.106	0.153	2
Red sage (late establishment)	Salvia greggii	0.8	1.1	0.18	3.192	3.239	2
Arizona rosewood	Vauquelinia californica	5.6	5	0.31	0.065	0.112	2

Mulberry trees were very low water users and probably should be included on the low water use plant list. Privets were also low water users. The other plants not on the low water use list used a high amount of water. One plant on the low water use list which showed a high ET rate (red sage) was planted late in the experiment. Because watering was triggered by “yellowing” of the leaves, it is possible that the yellowing was due to inadequate root development rather than a lack of soil water. Many of the plants used approximately half of the “desert” plant ET rate (0.12 inches). There was some rainfall during the 3 months that the experiment was conducted (4.2 inches). Over 90 days, the average precipitation was 0.047. In table 2, 0.047 was added to the ET rate calculated based on irrigation application. This number is shown in the second to last column.

ET (including precipitation for calculation of water application) rates for the low water use plants are in the range of 0.12 in/day as is generally recommended for low water use plants. African sumac, mesquite, and pine ET rates were slightly higher than 0.12 in/day. Oleander, acacia, and pyracantha ET rates were slightly lower than 0.12 in/day. Texas Ranger and Arizona rosewood ET rates were approximately equal to 0.12 in/day.

References

Desai, J.B. 1981. Water requirements of urban plants. M.S. Thesis. Soils, Water, and Engineering. The University of Arizona.