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GARDEN WATER USE IN UTAH

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The goal of garden irrigation is to maintain yield and quality by replacing water lost to the atmosphere from the soil by evaporation, and from leaf surfaces by transpiration. The combination of evaporation and transpiration is referred to as evapotranspiration (Et), or simply water use. Garden water use is presented in units of inches of water per day, week or month. Inches of water is a useful measure since it can be directly related to the inches of water applied by a sprinkler system over time to determine irrigation scheduling.

Garden water use is affected by seasonal variations in air temperature and other weather conditions. Water use is relatively low in the spring, increases in late June through July and early August, then decreases through the end of August into September and October. Table 1 summarizes monthly garden water use rates for various locations throughout Utah. To calculate daily water use, divide the Table 1 monthly estimates by 30. For example, daily garden water use for the month of June in Beaver would be approximately: 5.12 inches ÷ 30 days ≈ 0.17 inch per day. The information from Table 1 is based on long term average water use for each location.

SOIL WATER STORAGE

The amount of water in the soil available for garden plant use depends on the rooting depth and soil type. Unless there is a limiting layer, most garden plant roots will be found in the top 1 to 1 ½ feet of soil. Water holding capacities vary from about 1 inch per foot of depth in a sandy soil to about 2 inches per foot of depth in a loam soil. Therefore, in a sandy soil, one inch of water is available for plant use in a 1 foot root zone. In a loamy soil, 2 inches of water would be available in the same 1 foot root zone. To prevent drought stress and maintain yield and quality, ***irrigation is recommended when 50 percent of the water has been used from the root zone***. In a sandy soil, irrigation should occur when approximately ½ inch of water has been used by garden plants with a 1 foot rooting depth. In a loam soil, approximately 1 inch of water could be used from the 1 foot root zone between irrigations.

IRRIGATION SCHEDULING

As an example of irrigation scheduling, assume the garden uses 0.17 inch of water per day in June at Beaver (see above example). To maintain garden plants with a 1 foot rooting depth in a sandy soil, an irrigation of ½ inch would be needed every 2 ½ days (0.5 inch water ÷ 0.17 inch

use per day ≈ 2 ½ days). In a loam soil, 1 inch of irrigation could be applied every 5 ½ days (1.0 inch water ÷ 0.17 inch use per day ≈ 5 ½ days). The irrigation depths and frequencies calculated here assume uniform application of water by the system and a 1 foot root zone. If water is not applied uniformly actual irrigation requirements (inches applied) may be higher to insure that areas receiving less water from the system are irrigated adequately. During establishment, garden plants are also shallow-rooted and will generally require more frequent irrigations with less water to maintain a moist zone near the seed or transplant. For more information about irrigation scheduling, see the Utah State University Extension web site extension.usu.edu/drought.

Table 1. Monthly and total seasonal water use estimates (in inches) for gardens from various Utah locations.

Location	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Season total
Beaver	–	–	–	1.04	5.12	6.55	1.94	0.18	–	–	14.83
Blanding	–	–	–	1.70	3.60	6.74	3.86	0.72	–	–	16.62
Castle Dale	–	–	–	1.38	3.62	6.62	6.00	1.82	0.26	–	19.71
Cedar City	–	–	–	1.61	3.81	6.98	4.05	0.85	–	–	17.3
Corinne	–	–	0.15	2.14	6.19	5.98	1.94	0.79	–	–	17.19
Delta	–	–	–	1.66	4.02	7.76	4.41	1.05	–	–	18.90
Farmington	–	–	0.39	1.79	4.18	7.20	4.08	1.03	0.29	–	18.96
Heber	–	–	–	0.40	2.45	5.88	5.09	0.64	–	–	14.45
Kanab	–	–	–	2.08	4.82	7.35	2.92	1.20	0.40	–	18.76
Logan	–	–	–	1.61	3.43	6.44	4.56	0.62	–	–	16.66
Manti	–	–	–	1.26	3.06	6.16	6.12	1.43	–	–	18.03
Moab	–	–	0.26	2.23	5.62	7.21	2.46	1.28	0.55	–	19.60
Nephi	–	–	–	1.39	3.34	6.68	4.61	1.14	–	–	17.16
Odgen (Sugar Factory)	–	–	0.44	1.87	4.40	7.33	4.19	1.02	0.38	–	19.63
Panguitch	–	–	–	–	2.39	5.47	4.82	0.81	–	–	13.50
Pleasant Grove	–	–	–	1.89	4.82	7.08	2.43	0.88	–	–	17.09
Richfield	–	–	–	0.98	2.87	5.87	5.90	1.30	–	–	16.93
Roosevelt	–	–	–	1.70	3.79	7.17	4.84	1.13	–	–	18.63
Salt Lake (Airport)	–		0.55	2.07	5.30	7.28	2.62	0.97	0.21	–	18.99
St. George	–	0.45	1.57	4.15	7.85	6.95	2.03	1.31	0.54	–	24.84
Tooele	–	–	–	1.79	3.57	6.45	5.16	0.77	–	–	17.74
Vernal	–	–	–	1.83	3.82	6.99	4.82	0.70	–	–	18.15

Adapted from *Consumptive Use of Irrigated Crops in Utah*. Utah Agriculture Experiment Station Research Report No. 145. Oct 1994. The complete set of crops and sites can be found on the web at: http://waterrights.utah.gov/techinfo/consumpt/default.htm

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