

Xeriscape Program

The term Xeriscape is derived from the Greek word xeros, which means dry. Some people who are unfamiliar with the term confuse the "xeri" with "zero" and as a result, think Xeriscapes have no plants and require no water. Xeriscapes do have plants and they do require water, but they require much less than a traditional grass yard. Since we live in a desert, less water intensive landscaping is a desirable choice.

Principles of Xeriscape

- Good Landscape Planning and Design
- Appropriate Turf Areas
- Efficient Irrigation
- Use of Proper Soil Amendments
- Use of Mulches
- Low Water Use Plants
- Appropriate Maintenance

Glossary:

landscape: to modify or ornament (a natural landscape) by altering the plant cover

turf: the upper layer of soil bound by grass and plant roots into a thick mat

irrigation: to supply (as land) with water by artificial means

soil amendments: nutrients added to the soil to feed plants

mulch: a protective covering (sawdust, compost, or paper) spread or left on the ground to reduce evaporation, maintain even soil temperature, prevent erosion, control weeds, enrich the soil, or keep fruit clean

Arizona Municipal Water Users Association's web site: <http://www.amwua.org/what-you-can-do/landscape-and-garden>

Estimated Water Requirements for Tucson

(For plants with a 10 foot canopy diameter using a drip irrigation system)

| Month of Year | Native Trees* (Gallons per day) | Fruit Trees (Gallons per day) | High Water Trees** (Gallons per day) |
|---------------|------------------------------------|----------------------------------|--|
| January | 1.3 | 2.9 | 3.1 |
| February | 1.9 | 4.1 | 4.4 |
| March | 2.8 | 6.1 | 6.5 |
| April | 3.9 | 8.5 | 9.1 |
| May | 4.6 | 10.1 | 10.8 |
| June | 5.2 | 11.3 | 12.2 |
| July | 4.5 | 9.6 | 10.4 |
| August | 3.8 | 8.3 | 8.9 |
| September | 3.6 | 7.7 | 8.3 |
| October | 2.8 | 6.1 | 6.5 |
| November | 1.8 | 3.8 | 4.1 |
| December | 1.2 | 2.6 | 2.8 |

* Examples of native trees include Palo Verde, Sweet Acacia, and Mesquite.

** Examples of high water trees include Cottonwood, Ash, and Mulberry.

Data obtained from *Guidelines for Drip Irrigation Systems* prepared by the **Arizona Landscape Irrigation Guidelines Committee, July 2001**

Estimated Water Requirements for Phoenix
 (For plants with a 10 foot canopy diameter using a drip irrigation system)

| Month of Year | Native Trees* (Gallons per day) | Fruit Trees (Gallons per day) | High Water Trees** (Gallons per day) |
|---------------|------------------------------------|----------------------------------|--|
| January | 1.2 | 2.5 | 2.7 |
| February | 1.8 | 3.8 | 4.1 |
| March | 2.6 | 5.7 | 6.2 |
| April | 3.8 | 8.3 | 8.9 |
| May | 4.6 | 9.9 | 10.6 |
| June | 5.1 | 11.1 | 12.0 |
| July | 4.8 | 10.5 | 11.3 |
| August | 4.3 | 9.2 | 9.9 |
| September | 3.7 | 8.0 | 8.6 |
| October | 2.6 | 5.7 | 6.2 |
| November | 1.6 | 3.5 | 3.8 |
| December | 1.0 | 2.2 | 2.4 |

* Examples of native trees include Palo Verde, Sweet Acacia, and Mesquite.

** Examples of high water trees include Cottonwood, Ash, and Mulberry.

Data obtained from *Guidelines for Drip Irrigation Systems* prepared by the **Arizona Landscape Irrigation Guidelines Committee, July 2001**

Water Use T-Charts

Month of Use _____

| Native Trees | | Fruit Trees | | High Water Trees | |
|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|
| Number of Days Watering | Amount of water (in gallons) | Number of Days Watering | Amount of water (in gallons) | Number of Days Watering | Amount of water (in gallons) |
| 1 | | 1 | | 1 | |
| 2 | | 2 | | 2 | |
| 3 | | 3 | | 3 | |
| 4 | | 4 | | 4 | |
| 5 | | 5 | | 5 | |
| 6 | | 6 | | 6 | |
| 7 | | 7 | | 7 | |
| 8 | | 8 | | 8 | |
| 9 | | 9 | | 9 | |
| 10 | | 10 | | 10 | |
| | | | | | |
| 20 | | 20 | | 20 | |
| 30 | | 30 | | 30 | |
| | | | | | |
| <i>n</i> | | <i>n</i> | | <i>n</i> | |

January Water Use T-Chart: Answer Sheet for Tucson

| Native Trees | | Fruit Trees | | High Water Trees | |
|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|
| Number of Watering Days | Amount of water (in gallons) | Number of Watering Days | Amount of water (in gallons) | Number of Watering Days | Amount of water (in gallons) |
| 1 | 1.3 | 1 | 2.9 | 1 | 3.1 |
| 2 | 2.6 | 2 | 5.8 | 2 | 6.2 |
| 3 | 3.9 | 3 | 8.7 | 3 | 9.3 |
| 4 | 5.2 | 4 | 11.6 | 4 | 12.4 |
| 5 | 6.5 | 5 | 14.5 | 5 | 15.5 |
| 6 | 7.8 | 6 | 17.4 | 6 | 18.6 |
| 7 | 9.1 | 7 | 20.3 | 7 | 21.7 |
| 8 | 10.4 | 8 | 23.2 | 8 | 24.8 |
| 9 | 11.7 | 9 | 26.1 | 9 | 27.9 |
| 10 | 13 | 10 | 29 | 10 | 31 |
| | | | | | |
| 20 | 26 | 20 | 58 | 20 | 62 |
| 30 | 39 | 30 | 87 | 30 | 93 |
| | | | | | |
| <i>n</i> | $1.3n$ | <i>n</i> | $2.9n$ | <i>n</i> | $3.1n$ |

January Water Use T-Chart

Answer Sheet for Phoenix

| Native Trees | | Fruit Trees | | High Water Trees | |
|-------------------------|------------------------------|-------------------------|------------------------------|-------------------------|------------------------------|
| Number of Days Watering | Amount of water (in gallons) | Number of Days Watering | Amount of water (in gallons) | Number of Days Watering | Amount of water (in gallons) |
| 1 | 1.2 | 1 | 2.5 | 1 | 2.7 |
| 2 | 2.4 | 2 | 5.0 | 2 | 5.4 |
| 3 | 3.6 | 3 | 7.5 | 3 | 8.1 |
| 4 | 4.8 | 4 | 10.0 | 4 | 10.8 |
| 5 | 6.0 | 5 | 12.5 | 5 | 13.5 |
| 6 | 7.2 | 6 | 15 | 6 | 16.2 |
| 7 | 8.4 | 7 | 17.5 | 7 | 18.9 |
| 8 | 9.6 | 8 | 20 | 8 | 21.6 |
| 9 | 10.8 | 9 | 22.5 | 9 | 24.3 |
| 10 | 12 | 10 | 25 | 10 | 27 |
| | | | | | |
| 20 | 24 | 20 | 50 | 20 | 54 |
| 30 | 36 | 30 | 75 | 30 | 81 |
| | | | | | |
| <i>n</i> | $1.2n$ | <i>n</i> | $2.5n$ | <i>n</i> | $2.7n$ |

Assessment: Trees for the Parking Lot

A large discount department store named StuffMart is planning to build a new store and parking lot in your town. They would like to plant 50 trees around the parking lot and have hired you as a water and landscaping consultant. They haven't decided what kinds of trees to plant around the parking lot. The manager is from New York, and she thinks mulberry trees would be nice. The assistant manager suggested planting orange trees. He thinks the customers would like to pick a few oranges to take home with them after shopping. One of the cashiers, who grew up in Arizona, suggests planting mesquite trees because people in Arizona are so accustomed to seeing them everywhere.

They are all concerned about the cost of watering the trees, particularly in peak watering months of the summer. There is a rumor that water rates will soon be going up to \$0.05 a gallon. Your job is to provide information about the amount of water necessary and the cost of watering for each of the three different types of trees. The manager would like a chart that shows the watering amounts and costs for one, two, three, and four weeks in June for each tree. She would also like formulas that she can use to calculate the amount of water and the cost for watering any number of days in June. Finally, she would like you to write a letter to the staff of StuffMart summarizing your analysis of the watering costs and stating which type of tree you would recommend planting in the StuffMart parking lot.

Rubric for Scoring Trees for the Parking Lot

T-Chart

| CATEGORY | 4 | 3 | 2 | 1 |
|------------------------------------|--|---|---|--|
| Data Table | Data in table is well organized, completely accurate, and easy to read. | Data in table is fairly organized, accurate, and easy to read. | Data in the table is somewhat accurate and easy to read. | Data in table is not accurate and/or cannot be read. |
| Neatness and Attractiveness | Exceptionally well designed, neat, and attractive. A ruler and graph paper are used. | Neat and relatively attractive. A ruler and graph paper are used to make the graph more readable. | Lines are neatly drawn but the graph appears quite plain. | Appears messy and “thrown together” in a hurry. Lines are visibly crooked. |
| Units | All units are described (in a key or with labels). | Most units are described (in a key or with labels). | Some units are described (in a key or with labels). | Units are not described. |

Letter

| CATEGORY | 4 | 3 | 2 | 1 |
|---|---|---|---|--|
| Content Accuracy | The letter contains at least 5 accurate facts about water usage in Arizona. | The letter contains 3-4 accurate facts about water usage in Arizona. | The letter contains 1-2 accurate facts about water usage in Arizona. | The letter contains little or no accurate facts about water usage in Arizona. |
| Ideas | Ideas were expressed in a clear and organized fashion. Recommendation is easily understood. | Ideas were expressed in a pretty clear manner, but the organization could have been better. | Ideas were somewhat organized, but were not very clear. It took more than one reading to figure out what the letter was recommending. | The letter seemed to be a collection of unrelated sentences. It was very difficult to figure out what the writer was recommending. |
| Grammar & spelling (conventions) | Writer makes no errors in grammar or spelling. | Writer makes 1-2 errors in grammar and/or spelling. | Writer makes 3-4 errors in grammar and/or spelling | Writer makes more than 4 errors in grammar and/or spelling. |

Sample TUCSON Response:
Trees for the Parking Lot—June Calculations

| Mulberry Trees | | |
|----------------|-----------------------|----------------------------|
| | Water (in gallons) | Cost per tree (in dollars) |
| 1 week | 85.4 | \$4.27 |
| 2 weeks | 170.8 | \$8.54 |
| 3 weeks | 256.2 | \$12.81 |
| 4 weeks | 341.6 | \$17.08 |
| Formula | 12.2 x number of days | \$0.61 x number of days |

| Orange Trees | | |
|--------------|-----------------------|----------------------------|
| | Water (in gallons) | Cost per tree (in dollars) |
| 1 week | 79.1 | \$3.96 |
| 2 weeks | 158.2 | \$7.91 |
| 3 weeks | 237.3 | \$11.87 |
| 4 weeks | 316.4 | \$15.82 |
| Formula | 11.3 x number of days | \$0.565 x number of days |

| Mesquite Trees | | |
|----------------|----------------------|----------------------------|
| | Water (in gallons) | Cost per tree (in dollars) |
| 1 week | 36.4 | \$1.82 |
| 2 weeks | 72.8 | \$3.64 |
| 3 weeks | 109.2 | \$5.46 |
| 4 weeks | 145.6 | \$7.28 |
| Formula | 5.2 x number of days | \$0.26 x number of days |

To the Manager and Staff of StuffMart:

We definitely recommend that you plant mesquite trees in your parking lot. Mesquite trees are native to Arizona and will use much less water than the other trees and cost much less. The mulberry trees will cost you \$17.08 per tree during the month of June. If you multiply that times 50 trees, you will be paying \$854.00 for watering costs in June! Compare this to \$7.28 per tree for mesquite trees. Even with 50 trees, you will only be paying \$364.00 in June. This is less than half the cost of the mulberry trees. We also think it is good for public relations that you advertise that you use xeriscape principles in your parking lot design. People who shop at StuffMart can learn that using drought tolerant and native plants can help cut down on water use in the desert.

Sincerely,
 The Water Management Team

Sample PHOENIX Response:
Trees for the Parking Lot—June Calculations

| Mulberry Trees | | |
|----------------|-----------------------|----------------------------|
| | Water (in gallons) | Cost per tree (in dollars) |
| 1 week | 84 | \$4.20 |
| 2 weeks | 168 | \$8.40 |
| 3 weeks | 252 | \$12.60 |
| 4 weeks | 336 | \$16.80 |
| Formula | 12.0 x number of days | \$0.60 x number of days |

| Orange Trees | | |
|--------------|-----------------------|----------------------------|
| | Water (in gallons) | Cost per tree (in dollars) |
| 1 week | 77.7 | \$3.89 |
| 2 weeks | 155.4 | \$7.77 |
| 3 weeks | 233.1 | \$11.66 |
| 4 weeks | 310.8 | \$15.54 |
| Formula | 11.1 x number of days | \$0.555 x number of days |

| Mesquite Trees | | |
|----------------|----------------------|----------------------------|
| | Water (in gallons) | Cost per tree (in dollars) |
| 1 week | 35.7 | \$1.79 |
| 2 weeks | 71.4 | \$3.57 |
| 3 weeks | 107.1 | \$5.36 |
| 4 weeks | 142.8 | \$7.14 |
| Formula | 5.1 x number of days | \$0.255 x number of days |

To the Manager and Staff of StuffMart:

We definitely recommend that you plant mesquite trees in your parking lot. Mesquite trees are native to Arizona and will use much less water than the other trees and cost much less. The mulberry trees will cost you \$16.80 per tree during the month of June. If you multiply that times 50 trees, you will be paying \$840.00 for watering costs in June! Compare this to \$7.14 per tree for mesquite trees. Even with 50 trees, you will only be paying \$357.00 in June. This is less than half the cost of the mulberry trees. We also think it is good for public relations that you advertise that you use xeriscape principles in your parking lot design. People who shop at StuffMart can learn that using drought tolerant and native plants can help cut down on water use in the desert.

Sincerely,

The Water Management Team