High on the Desert Cochise County Master Gardener Newsletter

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Watering—When and How

Okay—warm weather season is here and the most common question asked is how often and how long should the gardener water. Factors affecting plant water requirements are plant type, plant maturity, soil type, season/climate, microclimate/ exposure, and soil cover/mulch. The only way I know how to determine irrigation frequency (when it is time to water) and duration (how much water to apply) is to use a soil probe. A soil probe is a ¼ to 3/8 inch diameter metal rod that is at least three feet long with a pointed end. I prefer a soil probe that is four feet long so I can tell if I've over-watered. Probe the garden for one year, use a rain gauge to track rainfall totals, and record the results in a garden diary or calendar. You will become much more knowledgeable on how your garden behaves and will be able to set up a tailored irrigation schedule to meet the needs of your plants not because the calendar says it's Thursday so it must be time to water again. Keep in mind that during the hot days some plants, especially those with large leaves, may droop or collapse their leaves. Don't assume that they need water. Look at the plants the following morning. If they are still droopy then water but don't be surprised to find them perky—plants often fold their leaves to reduce the amount of sunlight hitting them—a plant survival tactic.

HOW TO DETERMINE WHEN IT IS TIME TO WATER:

1. Push the probe into the soil around the drip line of plants as deep as it will go.
2. The probe will stop when it hits dry soil.
3. Measure the depth the probe has penetrated. A good rule of thumb is it's time to re-irrigate when 1/3 to ½ of the root zone is dry:
   - Turf, groundcovers, vegetables, annuals – irrigate when probe depth is 4-6 inches
   - Perennial flowers and shrubs – irrigate when probe depth is 8-12 inches
   - Trees (and very large shrubs) – irrigate when probe depth is 12-18 inches

HOW TO DETERMINE WHEN ENOUGH WATER HAS BEEN APPLIED:

1. Push the probe into the soil and measure the depth the probe has penetrated. Apply water using your usual irrigation method for one hour.
2. Wait for 30 minutes after irrigation then push the soil probe into the soil.

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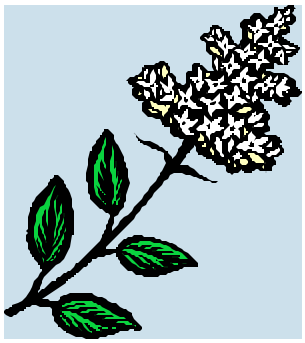
In a Desert Garden

Growing Buddleia

Buddleia—butterfly bush, is a lovely shrub with wonderful blossoms that attract butterflies and hummingbirds. The most commonly grown Butterfly bush is *B. davidii*. This plant is a native of China and in our mild climate stays evergreen. Buddleia can grow into a large shrub depending on the variety and how much water it gets. This shrub comes in many beautiful colors. Most buddleia are hybrids and sterile.

I grow several of these lovely shrubs in my little garden. The first one was planted by my landscaper and is now 8 years old. It has lovely purple flowers and grey leaves. The flowers look similar to those of lilacs and that is why the plant is often called "Summer Lilac," but it lacks the sweet fragrance. This one is the Chinese native and self-seeds itself. One of the seedlings came up in the front of our house and it is the strongest and tallest of them all growing to 12 ft. with huge leaves and huge flowers; it doubled the size of its parent plant. It took me a while to figure out this mystery. When I placed it on my irrigation system, I accidentally put it on the line of my canna bed which gets more water.

In my backyard I treat these plants like low-water plants and give them an infrequent, deep watering. That keeps the plants in manageable size and blooming just as well. In my backyard I grow several different species of this genus in different colors. In the middle of my yard I planted *B. davidii* "Alba" with bvely white blossoms. Next to my porch you find a plant with almost blue flowers and very grey leaves and on the other side of my yard is a plant with deep pink flowers. These varieties grow to 4–6 ft. in size. I also planted a variety called "Black Knight" with deep purple to almost black flowers and "Harlequin" a variegated variety with beautiful green leaves with white edges and purple pink flowers. Unfortunately these plants seemed not to be as strong and long-lived as the other varieties. They became very woody and did not flower much and I finally took them out. My neighbor had the same problem with his "Black Knight." I have not had any problems with my other buddleias. They have never had an insect attack or a fungus.



I planted another beautiful shrub, *B.x weyeriana*, a hybrid between *B. davidii* and *B.globosa*. My variety is "Honeycomb" and has unusual flowers, yellow balls growing in clusters. Another variety growing in my yard is *B. marrubifolia*, the woolly butterfly bush. This one is native to Texas and the North of Mexico. It is a true xeric plant and does not receive any additional water after the first 2 years. It has lived now for eight years and is doing just fine. It has very attractive silvery, wooly foliage and small ball-shaped orange flowers that appear in masses in early summer, and it has grown to 4 ft. tall. The silvery foliage is very attractive growing between my other shrubs in different shades of green. I have noticed butterflies prefer the other varieties.

If you have a large enough yard or a big space to fill, you might want to grow *B. alternifolia*—fountain butterfly bush, another native to China. It can grow to 12 ft. in height and width and has arching, willow-like branches. It only blooms in spring with profuse clusters of blue purple flowers. This is the only Buddleia with some fragrance.

B. davidii blooms on new wood and if left unpruned the leaves and flowers become smaller and smaller. The plants need to be cut back by two thirds in late winter or early spring. This keeps the leaves and flowers big and the shrub in a manageable size. Buddleia does well in most soils that have good drainage. They like it hot and require full sun. A good gravel mulch is helpful and attractive. I have never fertilized mine, but they get my nutritious pond water from time to time. You might want to fertilize them with fish emulsion once in spring.

Every spring I end up with a lot of cuttings from my shrubs. The one in the front yard fills two black yard bags alone. What to do with the cuttings? If you have room, compost them. The garbage bin is not the place for them. Yard scraps do not belong in the landfill. If you are like some of my neighbors and there is a wash close by, you can drag them over the road and dump them in or near the wash, and that is exactly what some of them do. I have not been able to educate these people yet despite attempts. The wash is maintained by my husband, Mickey, and me and from time to time we have to go and drag everything back out. Yard waste does not belong in or near a wash. Besides being unsightly it introduces alien seeds and plant pathogens into a native environment.

Okay, what to do with the cuttings? If you live in the Sierra Vista city limits and pay for garbage removal, the City has a wonderful program for you—the Compost Facility. Call 458-7530 before 2:00 pm on Tuesday and then set the bags of yard waste out where you would put your garbage can and on Wednesday they pick it up for FREE. Cacti need to be in boxes. Doesn't that beat dragging the yard waste over the road to the wash? As a plus you can buy wonderful compost and mulch from them for a little fee.

Angel Rutherford, Master Gardener

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Carolyn Gruenhagen
Editor

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3. Measure the depth the probe has penetrated. Subtract the before irrigation soil probe depth to arrive at the actual one hour irrigation penetration rate.
4. The proper irrigation depths for plants are:
   - Turf, groundcovers, vegetables annuals – 12 inches
   - Perennial flowers and shrubs – 24 inches
   - Trees (and very large shrubs) – 36 inches
5. Once it has been determined how long it takes to wet the soil to the proper rooting depth, adjust the irrigation time, and water this same duration every time irrigation is required.

Ideally separate irrigation lines should be installed for the following:

- Turf (12 inch irrigation depth)
- Vegetables (12 inch irrigation depth)
- Annual bedding plants (12 inch irrigation depth)
- Desert drought tolerant plants (plants are adapted to our climates – require less irrigation)
- Non-drought tolerant plants (plants are NOT adapted to our climates – require more irrigation)

Due to the different irrigation depths for both desert and non-desert plants, separate irrigation zones should be considered for:

- Trees and very large shrubs (36 inch irrigation depth)
- Perennial flowers and shrubs (24 inch irrigation depth)

It is very helpful to find out how deep one gallon of water will penetrate into the soil. I developed a "low-tech" soil penetration kit. It consists of a one-gallon drip emitter attached to a 24 inch long piece of ¼ drip irrigation tubing poked into the bottom of a one-gallon plastic milk jug. Fill the jug up with water, elevate it on a 5-gallon nursery pot and let the water drip onto dry soil in the garden area. In about 1 ½ hours go out and probe the spot. This is an easy way to calculate the approximate depth that one gallon of water will penetrate! You may have to do this at different sites depending on different soil structures at each site (*i.e.* compacted areas will be different from loamy vegetable gardens). You can do the math to determine how long to water to reach the appropriate plant rooting depths.

Cheri Melton, Master Gardener

June Reminders

- **Check tree ties**
- **Mulch trees & shrubs**
- **Remove faded flower**
- **Fertilize roses**
- **Watch for curly top on tomatoes**
- **Water! Water! Water!**

The Agent's Observations

The first three days of May I attended and gave two presentations at the International Society of Aboriculture, Western Chapter, Annual Meeting in Phoenix. There were nearly 500 "tree workers" in attendance. I was impressed with a presentation made by Dr. Greg McPherson, about the benefits of trees. He with others have completed a booklet titled, *Desert Southwest Community Tree Guide*. This booklet is available for review in the Cochise County Master Gardener Office, at the UA, South. The project was completed by the US Forest Service's Center for Urban Forest Research, Davis, CA. Greg was previously employed by the University of Arizona in the Department of Landscape Architecture. Below please find a short summary of his informative presentation.

Environmental Benefits of Trees in Urban Areas, Greg McPherson and Jim Geiger

In the past, trees were often included in local plans primarily as beautification elements. Today many planners have realized that trees play a much greater role. They are a critical factor in human health and well being, affecting the overall quality of life in communities. Over the past 20 years urban tree researchers have learned that trees in urban areas improve air quality, conserve energy, reduce storm water runoff, increase property values, attract businesses, reduce stress, increase healing and decrease crime. More recently, researchers at the Center for Urban Forest Research have been able to place a dollar value on some of these benefits, such as storm water runoff and watershed health, air quality and greenhouse gas reduction, and energy conservation.

Watershed Benefits

The Clean Water Act regulations require municipalities to obtain a permit for managing their storm water discharges into water bodies. Each community's program must identify which best management practices (BMPs) will be implemented to reduce pollutant discharge. Healthy trees with large leaves and rough surfaces can reduce the amount of runoff and pollutant loading in receiving waters. Trees control runoff at the source by intercepting and storing rainfall, reducing runoff volumes and erosion of watercourses, as well as delaying

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The Virtual Gardener—The Russians Are Coming, The Russians Are Coming!!!

No, there are no Russian submarines in the San Pedro, but there are Russian invaders everywhere in the county—Russian thistles (AKA tumbleweeds), that is. Our spring rains and mild winter temperatures created the perfect conditions for tumbleweeds to sprout. I haven't had a tumbleweed in my yard for the last 15 years. This year they're everywhere.

The song made famous by the Sons of the Pioneers made tumbling tumbleweeds an icon of the West, but they are not native to North America and in fact are fairly recent arrivals on this continent. Russian thistles, *Salsola tragus* (AKA *S. iberica, S kali, and S.australis)* are native to Central Asia and were first detected in South Dakota in 1873. They are thought to have arrived with a shipment of flax seed from the Ukraine.

Russian thistles are members of the Goosefoot (Chenopodiaceae) family and have unusual seeds. Unlike most plants that produce seeds with a hard shell or coating that contains a reserve of food for the young plant, the seeds of Russian thistle comprise only a membrane and a coiled embryonic plant ready to uncoil and germinate when the right moisture and temperature conditions occur. Germination can occur even when nighttime temperatures are below freezing and daytime temperatures are as low as 36ºF, although daytime temperatures between 45-95ºF are considered optimal. Only as little as a third of an inch of rainfall is sufficient to initiate germination, and the young plants begin photosynthesizing immediately.

Young seedlings can only survive on disturbed soils since their roots are too weak to penetrate hardened soils. They normally emerge from depths of less than half inch but can emerge from as deep as 2½ inches. The seeds normally survive for only about a year or two in the soil. Tumbleweeds are also fairly salt-tolerant (hence the genus name) which makes them well adapted to our arid climate soils.

Once the plants mature in late summer and early fall (July-October) they dry to crisp brown skeletons that break off from the roots and tumble across the landscape driven by the wind. It is this tumbling that disperses the seeds. An average sized plant can produce 1500-2000 seeds and a very large plant can produce up to 100,000 seeds! That is why early control of this weed is important.

The best time to control these invaders is NOW! Don't wait until they mature and scatter their seeds across the land. Because of their distinctive bright blue-green color, they are easy to spot now. You can pull them by hand, but be aware that they may cause a rash where they touch your skin. You can also mow them but unless the mower cuts them close enough to the top of the root, they can regenerate. I like to use a shuffle hoe which cuts them off at or below ground level and can be used very selectively to avoid disturbing large areas of soil. For those of you who are into herbicides, they can also be controlled with pre-emergents such as oryzlin or post-emergents such as glyphosate.

If you would like to learn more about tumbleweeds, check out these Web sites:

http://www.desertusa.com/mag01/may/papr/tweed.html

http://www.calflora.net/bloomingplants/russianthistle.html

http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7486.html

Until next time, happy surfing

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Cuttings 'N' Clippings

❄ The next CCMGA meeting is 5:00 p.m. Thursday, June 2, 2005 at the University of Arizona South campus, Room 503.

❄ The free *Water Wise* Workshop on Saturday, June 4 from 9:00 to 11:00 a.m. at the Arizona Folklore Preserve will be presented by Cheri Melton, Native plant enthusiast and Master Gardener, called *Go Wild With Sensational Succulents.* For more information contact Cado Daily at the Cooperative Extension, Ext. 2139.

❄ We note the passing last month of David Eppele, founder of Arizona Cactus and Succulents of Bisbee and friend of the Cochise County Master Gardeners.

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the onset of peak flows. Rainfall that is stored temporarily on leaf and bark surfaces is called interception. Intercepted water evaporates, drips from leaf surfaces and flows down stem surfaces to the ground. Saturation generally occurs after 1 to 2 inches of rain have fallen. Rainfall interception by large trees is a relatively inexpensive, first line of defense in the battle to control nonpoint-source pollution when compared with more expensive solutions like retention basins. Trees intercept a portion of rainfall that evaporates and never reaches the ground. Some rainfall runs to the ground along branches and some falls through gaps or drips off leaves and branches. Trees with coarse textured surfaces retain more rainfall than ones with smooth surfaces. Tree crowns with few gaps reduce throughfall to the ground. Species that are in-leaf when rainfall is plentiful are more effective than deciduous species that have dropped their leaves.

Energy Benefits

Energy fuels economic growth and is an essential ingredient for quality of life. Greening cities with trees can help conserve this energy and this technique is often a cost-effective solution. For example, the Center for Urban Forest Research found that strategically planting 50 million more shade trees in California cities on the east and west sides of buildings will provide savings equivalent to seven 100-megawatt power plants. The cost of peak load reduction is $63/kW, considerably less than the $150/kW benchmark for cost-effectiveness. For more information see: *Green Plants or Power Plants?* **http://cufr.ucdavis.edu/products/3/cufr_148.pdf**

Principal Energy Benefits of Trees

Trees modify climate and conserve building energy use in three principal ways: 1) Shading, which reduces the amount of radiant energy absorbed and stored by built surfaces; 2) Transpiration, which converts liquid water to water vapor and thus cools by using solar energy that would otherwise result in heating of the air; and 3) Wind speed reduction, which reduces the infiltration of outside air into interior spaces and conductive heat loss, especially where thermal conductivity is relatively high (*e.g.*, glass windows).

Tree Locations for Energy Efficiency

For individual buildings, strategically placed trees can increase energy efficiency in the summer and winter. The west side is the most important side to shade. Plant evergreens to provide both summer shade and winter wind protection. The east side is the second most important side to shade. Deciduous trees on the east provide summer shade and more winter solar heat gain than evergreens. In the winter, solar access on the southern side of buildings can warm interior spaces. For more information see: *Save Dollars with Shade.* **http://cufr.ucdavis.edu/products/3/cufr_149.pdf**

Windbreaks

Trees planted as windbreaks can reduce heating costs in temperate climate cities. Windbreaks reduce wind speed and resulting infiltration of cold air by up to 50 percent, translating into potential annual heating savings of 10 to 12 percent.

Variations in Energy Savings

The amount of energy savings from trees varies regionally, as well as site by site. Savings are greatest in regions with the largest cooling and heating loads. A computer simulation of annual cooling savings for an energy-efficient home in Tucson found that three 25-foot tall trees saved $100 each year for cooling, a 25 percent reduction over previous years without the trees. In Denver, two 25-foot tall trees saved $15 each year for heating (4 percent savings) and $30 for cooling (24 percent savings). The total $45 savings represented a 9 percent reduction in annual heating and cooling costs.

Air Quality Benefits

In the U.S., 159 million people live in areas where ozone (O_3) concentrations violate federal air quality standards. In addition, 100 million people live in areas with unhealthy levels of dust and other particulate matter (PM10). Air pollution is a serious health threat to many city dwellers, causing coughing, headaches, respiratory and heart disease and cancer. Impaired health results in increased social costs for medical care, greater absenteeism and reduced longevity. Trees, sometimes called the "lungs of our cities," are important because of their ability to remove contaminants from the air. Air quality management districts have funded tree-planting projects to control dust and other small particles. Recently, the U.S. Environmental Protection Agency (EPA) recognized tree planting as a measure for reducing O_3 in State Implementation Plans (SIPs). This will create new opportunities to plant and care for trees as an air pollution control technology. For

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more information see: *Air Pollution Control -The Tree Factor.* **http://cufr.ucdavis.edu/products/cufr562_Newsletter_Jan05_Special_Edition.pdf**

Parking Lots and Trees

In urban areas, perhaps the greatest benefit from trees is the role they play in reducing the impacts of parking lots. According to a study by the Center for Urban Forest Research, parking lots occupy about 10 percent of the land in our cities. They act as miniature heat islands and are sources of motor vehicle pollutants. By shading cars and lowering parking lot temperatures, trees can reduce evaporative emissions of hydrocarbons (HC) that leak from fuel tanks and hoses. HC emissions are involved in O_3 formation; parked cars contribute 15 to 20 percent of total motor vehicle HC emissions. Parking lot tree planting is one practical strategy communities can use to meet and sustain mandated air quality standards. Many parking lot ordinances specify one tree for a certain number of parking spaces or a certain amount of planted area per space. However, under these ordinances, trees can be clustered in islands or along the lot perimeter, often resulting in large areas of unshaded pavement. To obtain more extensive shade it is necessary to increase tree numbers and provide more soil volume for tree roots; approximately 200 cubic feet (2.5 feet deep) for a 4-inch diameter tree and about 1,500 cubic feet for a 24-inch diameter tree. After the trees are installed, it is important that the new trees are pruned early to train their growth so crowns are allowed to reach their full potential, (no drastic pruning that disfigures the tree), and any dead trees replaced. For more information see: *Where Are All the Cool Parking Lots?* **http://cufr.ucdavis.edu/products/3/cufr_151.pdf**

Conclusion

City trees work ceaselessly, providing environmental services that directly improve human health and our quality of life. The benefits of trees are directly related to tree size. Larger trees provide greater benefits than smaller trees, other things being equal. Therefore, providing adequate growing space for large-stature trees is critical. As residential lot sizes shrink and building footprints grow, space for large-stature trees dwindles. Hence, planning public rights-of-way, parks and open space to accommodate large-stature trees is becoming critical. For more information on the benefits of urban trees visit the Center for Urban Forest Research at: **http://cufr.ucdavis.edu/**

About the Authors

Dr. E. Greg McPherson is director of the Center for Urban Forest Research, Pacific Southwest Research Station, USDA Forest Service. He conducts research that measures and models the benefits and costs of urban forests. Jim Geiger is the director of communications for the Center for Urban Forest Research.

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