Do you want to enjoy a lush, beautiful yard and still lower your water bill? Here are some tips to help cut water use, protect a vital natural resource and create a relaxing outdoor living space.

In the desert, we know that every drop of water falling from the sky is a precious and critical resource, a resource that must be wisely used. One way that we can use water wisely is to plan and install low water use landscapes.

Low water use landscapes can be lush and beautiful, and, at the same time, be relatively labor free. In order for this to happen, three elements must be incorporated into every landscape design. First, there must a selection of correct plants that are desert adapted and can survive on small amounts of water. Second, the landscape, where necessary, must be supported with a drip irrigation system that is correctly designed and functions correctly. Finally, our limited amounts of water falling as precipitation must be captured and used effectively.

Most landscapes are designed around five different types of plants: trees, shrubs, groundcover, vines and annual flowers. Each of these types of plants have a specific purpose in the landscape, and fill a certain need. By using low use plants in a landscape design, beauty can be still be maintained while lowering our total water consumption.

Trees provide shade, help screen out unsightly views and serve as a “ceiling” for outdoor living areas. Popular low water use trees include blue palo verde, desert willow, foothill palo verde, Chilean mesquite, Mediterranean fan palm and the Afghan pine.

Shrubs hide foundations, separate different areas within the landscape and form the “walls” of outdoor rooms. Frequently planted in desert landscapes are Baja fairy duster, red bird of paradise, brittlebush, Mexican honeysuckle and the Arizona rosewood.

Low-growing plants that lay flat on the surface of the soil are groundcover plants and provide a visual carpet for outdoor areas. Favorite choices for desert landscapes include the red spike ice plant, trailing dalea, trailing lantana, trailing rosemary and Saltillo primrose.

Vines help cover walls and define space when they are trained to a trellis or arbor. Good vines to consider are the Lady Bank’s rose, bougainvillea, lilac vine, pink trumpet vine and grape ivy.
Annual flowers and bedding plants add color and can be swapped out regularly for a nice change of pace depending upon the season. The Mexican gold poppy, desert bluebell, desert marigold, desert zinnia and the chaparral sage are popular annual flowers that will grow on very little water.

These plants, of course, are only a very few of the plants available that can fit into a hardy, low water use landscape. We invite you to study some of the many resources that can help you identify the right plant for your needs. Plan to visit museums and botanical gardens that specialize in drought tolerant plant displays, such as the Boyce Thompson Arboretum near Superior, to see these plants first hand. Look for the plants of your choice in local nurseries where you can get first hand information that will help you correctly design, install and care for your new landscape. In this manner you can become well versed in the proper use and care of low water use plants and avoid many problems that might otherwise occur.

In the garden or landscape, a serviceable drip irrigation system, properly designed, assembled and managed, is a wonderful tool to help conserve water.

Tailor-made for desert living, drip irrigation saves work, as well as water, and is economical and easy to use. The idea isn’t new, but bolstering a rising interest in this irrigation technology are the steady improvement and convenience of today’s systems, backed by the reality of the limited supply and rising cost of water.

There are many different variations of drip systems now operating throughout the area. Generally, the systems focus on drip, trickle, or ooze types of delivery, but can also include misting, spraying and sprinkling. Many stores carry a wide variety of components to design and assemble whatever kind of system that meets your particular situation. If you are thinking about installing a low water use drip system, we encourage you to visit with trained professionals. We also invite you to stop by our office to pick up a free bulletin or two. These will help you successfully plan, install and manage a drip irrigation system.

Another way to save on the water bill is to effectively use the rainfall that does fall from our desert skies. Each year during the winter wet season and the summer monsoon, many gallons of water fall onto hard surfaces like roofs, carport driveways and patios. A water catchment system to harvest this often wasted water is a good way to save money on the water bill. It is also helps us be good stewards of a very precious resource.

In Pinal County, annual rainfall averages between 8 and 12 inches annually, starting from the west side of the county and working east. Casa Grande averages 8.2 inches a year, Florence 9.8, and the San Pedro Valley between 10 and 12 depending upon the elevation. In general, the higher the elevation, the higher the annual average precipitation. In drought years, rainfall may be much less across the county.

Water harvesting systems capture water in three principal ways. These are water-spreading systems, diversion/terrace systems, and micro catchment systems. Each of these tools can be useful in urban settings.

By correctly selecting low water use plants, irrigating them appropriately with a carefully designed and maintained delivery system and making use of the rainfall that does come, it is possible to enjoy a beautiful, lush landscape and still protect our precious water resources.
One of the largest hurdles to overcome in growing a successful desert garden is to know what to do, and when to do it.

In most other parts of the country the garden season ends in late summer or early fall; certainly no later than the first frost for sure. When frosts and freezing temperatures come to the northern states and later to states further south, it is a sure sign to clean out the garden, mulch the soil, and get ready to take it easy, so to speak, for the cold winter months. In those climates, gardens can be orderly, easy to plan, and simple to manage. That plan simply will not work here in the desert.

You might be asking, “Why is that?” The main reason is that we have a year round garden season. We can grow something in the garden all year long. When we realize that there will be multiple planting windows, some overlapping with plants still in the ground and in full production, it becomes plain that gardening can become quite complex, really fast. Couple that fact with the challenge of hot summer temperatures and a bunch of other constraints that are normal to desert environments; our planting, growing, and harvesting schedule can be confusing to those who are used to the dormant-winter style of gardening. To ensure success, it is essential that we learn and follow the basic rules of gardening, including the gardening calendar, for our low desert conditions.

The first rule of gardening success is to plant flowers and vegetables at the appropriate time. For some types, we can plant twice in a year, maybe more. For example, tomatoes can be transplanted into the garden early in the year, as early as February with frost protection, for a late spring, early summer harvest. We can also place transplanted tomatoes into the garden in August for a late fall harvest. It is also possible, to carry tomato vines over the hot summer if we are careful, but usually the tomato russet mite or the heat damages the vines so badly that they never really recover. Some varieties are touted to produce fruit throughout our summers but more often than not, they simply shut down after temperatures climb over 90 to 100 degrees Fahrenheit. For tomatoes, it is best to plant early or late for good results. Either way, we run up against the danger of frost in the spring or the fall and protection from cold injury is often a key to tomato success.

In general, leafy greens and root vegetables can go into the garden around the 15th of September through mid-October and continue to produce with good water and fertilizer care through the late winter. Multiple planting dates for greens and root crops work best for long term production.

Cole crops like broccoli and cauliflower should be in the ground by mid-August. Sweet corn, squash, and melons, can be planted early spring and late summer. Sweet corn, though, does not like our summer heat. It is not the plant that has the problem, though. It will grow just fine. The problem lies in the fact that sweet corn pollen is damaged by high temperatures. Because of this, fertilization of the baby embryos that form the corn kernels on the cob does not take place. The end result is that some or all of the seeds do not develop leaving gaps or empty cobs at harvest.

The second rule is to maintain a good soil-plant-water relationship. While that sounds complicated, it essentially boils down to good soil and water management. Correct tillage, frequent fertilization, liberal use of organic matter, and proper irrigation are good examples. The environment in the soil, which supports the roots and their function, is critical to good plant health, growth, and development. Violation of these principles will lead to all kinds of problems in trees, shrubs, and garden plants. Problems resulting from poor soil conditions include: salinity buildup, soil compaction, soils that are too wet or too dry, and lack of nitrogen or other key nutrients.

The third rule is to watch out for and control pest problems. Pests can be not only just insects, but also weeds, nematodes, and plant diseases. All need to be carefully controlled to avoid problems. This, however, can get a little tricky because some insects and nematodes are “good guys” that help out in the garden. You want to keep them around. Beneficial insects especially help keep the “bad-guy” populations at bay, which is a big help in controlling both insects and the diseases that some of them carry from plant to plant. Big-eyed bugs (descriptive), lacewings,
minute pirate bugs, assassin bugs, and others all fit into this category. They feed on aphids, caterpillar larvae, and the eggs of plant-feeding insects. They often mean the difference between successful gardening and major wrecks. Some nematodes are beneficial in that they feed on other nematodes, but because these tiny microscopic round worms, not earthworms, are so small we usually do not know that they are even there and working for us. Nematodes, both the good and the bad, are mainly found mainly in sandy soils.

The final rule in my book, is to manage all of the plants correctly. This starts with planting trees, shrubs, vines, bedding plants, and vegetables correctly. The planting hole for container plants must be deep enough to accommodate the roots but shallow enough that the trunk itself is not buried. There are a few exceptions, however. Tomatoes, for example, may be planted deeply into the soil with perhaps only a few leaves showing. Roots will spring from the growing points where leaves come out of the stem. Tomato plants produce best when they have a lot of healthy roots under them.

Plant management also includes good watering practices. Irrigation frequency increases as the weather warms and decreases as the ambient air temperatures decline. To know when to irrigate, I like to dig down six inches into the ground, take a handful of soil, and squeeze it into a ball. If the soil forms a hard ball, and leaves a damp outline on my hand, there is plenty of water and I can wait to irrigate. If, on the other hand, the soil is only slightly moist and any ball that forms quickly breaks up as I move my fingers, it is time to irrigate. I never want the soil at six inches deep to go completely blow sand dry. It is not good for the plants.

The duration of any irrigation, that is, how long the water runs, is dependent upon many soil characteristics but the rule of thumb is to run the water only long enough to fill the root zone. For trees that is three feet deep. The root system for shrubs will extend down two feet into the ground, and for turf and bedding plants, twelve to eighteen inches. It is important to fill the root zone completely every time we irrigate to wet all of the roots, and to help leach out salts. A long screwdriver or soil probe will help determine how deep the water has sunk into the soil.

Most plants, except legume plants, will need to be fertilized regularly; mainly with a nitrogen fertilizer. Common landscape and garden plants in the legume family include mesquite, palo verde, ironwood, Cassia, peas, beans, and others. Legume plants form a working relationship with Rhizobium bacteria in the soil that allow them to pull nitrogen out of the air and turn it into nitrate, the cake and ice cream of the plant world. All other plants will need a dose of nitrogen regularly to keep them healthy.

Nitrogen can be added using commercial fertilizers such as ammonium sulfate, ammonium phosphate, ammonium nitrate, or urea. Other choices include an organic fertilizer such as blood meal, composted chicken manure, fish emulsion, or compost. Each plant will have a different nitrogen requirement, but most successful gardeners will give their plants a little nitrogen fertilizer about once or twice a month during the growing season. This will ensure that the plant will never run short. Other nutrients are applied occasionally, but in general, desert soils are usually well stocked with most nutrients as a result of the erosion and breakdown of the granite rocks in the mountains around us. Granite-based soils often test high in basic plant nutrients, with the exception of nitrogen.

There are many other factors that govern garden and landscape success, but these basic rules and principles will get a novice grower new to the desert a long way down the road to success.

Trade names used in this publication are for identification only and do not imply endorsement of products named or criticism of similar products not mentioned.
If you are considering a fall vegetable garden and just do not have the space or the time for a full fledged in-the-ground garden, you might consider planting your garden in containers. Containers, placed in sunny and warm areas outdoors, can be quite productive, ready to hand, and relatively hassle free. Container gardens must be carefully managed by watering and fertilizing in a timely manner, but the yield from these types of gardens can be amazing.

If your outdoor area is not conducive to gardening in any form, many gardeners have found good success growing vegetables in protected but sunny indoor locations, in an Arizona room, or in a passive solar greenhouse. Many of these tasty vegetables can pass for decorative houseplants, while the leafy greens and root crops make an interesting display along side your regular indoor plants.

If you are struggling against the predation of gophers, ground squirrels, and rabbits in your regular garden, containers can often be placed where these hungry pests cannot get at them. Some find this benefit of container vegetables quite attractive.

Vegetable gardens in containers can be a little touchy about their growing conditions, so it is important to pay attention to detail. The first choice is to make sure that your containers are of the correct depth. It is generally best to go with the larger containers, especially those that have enough depth to allow the proper growth and development of the root systems. Carrots, for example, will need the extra room to develop properly.

Just about any plant, even trees with the correct-sized pot, can be grown in containers. Plants that grow rapidly actually seem to do best. Tomatoes, eggplant, peppers, melons, and leafy vegetables are some of the edible plants that can flourish in containers.

Most plants will grow well in a porous, fairly rich, soil mix, and vegetables are no exception. Potting soil mixed with approximately one-third sand will provide an ideal environment for vigorous growth. Do not use steer manure. For one, you really do not want the aroma diffusing throughout your house, and two, manure, even composted manure, can harbor disease pathogens. You do not want that either. Choose a forest mulch compost or peat moss mix for your edible plants. A little regular desert soil, free of weeds, will help supply the basic nutrients needed by the plants.

Your container vegetable garden will require regular watering and a moderately humid environment so you will have to pay particular attention to your irrigation schedule. The potting soil should never get completely dry nor should it remain sloppy wet all the time either. A good way to tell if it is time to water is to stick your finger into the potting soil and feel for moisture content. The top inch of soils should be dry and only moderately damp about two inches down.

Many growers recommend keeping indoor plants on trays full of pebbles and water. This keeps the humidity around the plants up without risk of water logging the roots. Once your plants are up and growing they should be watered from above to help leach out salts which can be harmful to container plants.

Plants in containers also need adequate fertilization. Because the root system is confined to soil within the pot, available nutrients are more frequently mined from the relatively small area. Fish emulsion, or any houseplant food used at one half the recommended strength will provide sufficient nitrogen for almost all species. The constant but light application will provide the plant with the necessary nutritional needs required for good growth in the containers.
Make sure that the fertilizer applied contains all three of the major nutrients commonly provided by commercial fertilizers. These are nitrogen, phosphorus and potassium. Artificial container potting media will generally not provide large amounts of nutrient unless native desert soils are added. Standard potting soils usually require the use of a complete fertilizer. The label of the product will tell exactly what nutrients are provided.

The light requirements of vegetables vary. Most prefer full sun for much of the day. Others will do well in partial shade or indirect lighting. All plants grown indoors should be placed far enough away from cold window panes during the winter to not be affected by drafts, but close enough to get the right amount of light. Sure-fire signs of light deficiency include tall and spindly growth and turning their tops towards the source of light. Many people have found that it is better to invest in overhead lighting using bulbs that provide the full spectrum of light needed for good plant growth.

The choice of containers a key decision. While vegetables may be grown effectively in many different types of containers, it is important to know that healthy root systems are key to successful vegetable growth and development. Unglazed clay pots are porous, meaning that there is movement of air into the root zone through the pores in the ceramic, and movement of water out the same way. Air is important for good root health and evaporation of excess water from the outside of the pot is one way for excess water to drain away and air to enter.

Plastic containers do not allow for the exchange of air and water through the sides of the container. In these cases, it is important to monitor regularly the water content of the soil in the container and make sure that the medium does not stay sloppy wet all of the time. The utility of clay pots can be combined with the beauty of plastic pots by slipping the clay pot into a plastic pot to get the best of both worlds.

Every container should have good drainage out the bottom. Drainage is essential because of the root’s need for air. The potting soil should consist of about 50% solid material and 50% water and air. The spaces between the solid matter is where the water and air are found. During irrigation, most of the air in the mix is driven out. As the plant uses the water in the soil or as the water evaporates from the surface of the mix, air will begin to reenter the soil and follow down through the spaces. Ideally, there will be both water and air sufficient to maintain the good health of plants.

When beginning to garden in containers for the first time, it is advisable to start small and work up. There is a knack to growing good plants in containers. To avoid major failures, it is a good idea to work with one or two pots until you are confident that you maintain the plants in good condition.

Container gardening can be an exciting experience for all who love plants. Following a few basic rules will help bring success. For more information on how to garden in containers, ask for a copy of the Cooperative Extension leaflet, “Growing Vegetables in Containers”.
September 15th is the recognized time to plant fall vegetables and flowers. There is even still time at that date to plant fall sweet corn for a late crop. Most varieties of sweet corn take between 60 and 90 days from planting to harvest. Sweet corn planted now can be ready to eat sometime between mid-November and mid-December. The super sweet varieties have proven to be very popular in our area because of their great taste and sweetness. Pick out a variety that matures in 60 to 70 days and you should be okay.

Other vegetables that can be planted now include the leafy vegetables, like leaf and head lettuce, spinach, collards and turnips. Radishes do well now along with carrots and other root crops. Hold off on planting potatoes until December. They need the moderate temperatures of spring to mature.

It is best to forget about planting the heat-loving melons and squashes for this year. It is just too late to get a good crop even if the whiteflies were not such a threat. Plan on putting them into the garden in mid to late February for best production. It is also a little late for cauliflower and broccoli but warm winter weather might allow them to properly mature. They usually are planted in the middle of August.

Fall flowers include petunias, sweet peas, geraniums, sweet alyssum, and a whole host of other colorful annuals. Make sure to get rid of the Bermuda grass and other weeds from the flower bed before planting because there is still enough warm weather to make this weed a problem.

Soil preparation is an essential first step to ensuring success in the garden. Before planting, the soil should first be well tilled by spading or with a mechanical tiller. Make sure that all of the clods are broken up to allow good seed to soil contact. If you are going to flood irrigate, it will be important to level the soil to allow irrigation water to flow evenly through the plants. If you will be using a drip irrigation system, the clods still need to be broken down but it will not be necessary to level the soil.

If the garden site has not been used recently to grow plants, it is a good idea to “double dig” the garden. Double digging is a little labor intensive but it is well worth the effort. Simply dig out the top layer of soil in the garden, to the depth of the shovel blade, and set it aside in a pile. Throw in to the excavated area a good supply of compost, up to one-half of the volume of soil to be tilled, and spade or roto-till it in until it is well mixed with the soil and the soil is loose and well aerated. Then, mix in an equal amount of compost into the pile of soil from the top layer and refill the hole. With organic matter now down two shovel-lengths and a loose and well aerated soil ready to accept the root systems of your plants, there is an excellent chance that you will be able to grow a successful garden.

Whether you are double digging or not, a heavy application of compost or decomposed steer manure during soil preparation will improve water penetration, soften the soil, and reduce the number of clods that have to dealt with later on. It is also a good idea to add one half pound of ammonium phosphate (16-20-0) fertilizer or bone meal before tilling the soil to ensure plenty of nutrients for the tender young plants once they begin to grow.

It is essential that germinating seeds and young seedlings not be stressed for water during their early stages of growth. Regular, light irrigations with a misting hose attachment or with a sprinkler will apply water uniformly to the garden without washing out the seeds.

All plants should be planted following the instructions on the seed packets. Many vegetable and flower plants have different planting depths. Placing seed at the correct depth is critical to the success of all gardens.

The fall is also a great time to plant trees and shrubs. The high temperatures of summer can cause a young plant to give off more water through the leaves than the young roots can provide. This effect often throws the plant out of balance and leads to a condition known as ‘transplant shock’. Once the summer heat starts to melt away to the up and down temperatures of September and October, however, trees and shrubs in containers can usually be planted.
with the expectation of good success.

A major benefit to planting trees and shrubs during the fall growing season is the chance the additional time they have to establish a good root system before the winter dormancy period. Then, in the spring, the plants still have the plenty of time to continue root and top growth before the onset of the hot, dry temperatures of early summer.

If a plant is to survive the difficult climatic challenges of June, it will be because there is a root system sufficiently large enough to provide water and nutrients during that stressful time. A root system that is too small will not be able to provide sufficient water to prevent damage or death to the young plant.

Keep a careful eye on your developing citrus crop and do not let the tree miss an irrigation during this period. Infrequent irrigations can lead to slowing of fruit growth at a critical state in its development.

Interruption of growth of citrus fruit can cause the rind of the new fruit to become inflexible. Then, during an irrigation event, the arrival of the next flush of water from the roots can increase pressures, with devastating effects, inside the fruit. The rinds often cannot withstand the pressure and splitting occurs.

Another critical task is the application of nitrogen fertilizer. If the plants were not fertilized in August, it is important to provide all plants, especially citrus and deciduous fruits like apricots, peaches, and plums, with a late summer application of nitrogen. This element is essential for proper growth and development of all plants. It is the late summer application that has the most affect on the development of new buds, particularly fruit buds, for the next year.

With proper care and good timing, vegetable and flower gardens can provide both food and color for the coming outdoor season.

If you have questions about this newsletter, have any plant related problems, or wish to have a publication sent to you, please call (520) 836-5221 x204 or (520) 374-6263 and leave a message. If you have a plant problem and are able to email a picture, please send a picture with any information you can provide about the plant, and your contact information to our diagnostic team at macmastergardener@gmail.com and a Master Gardener will contact you.

This newsletter is available to view on our website at: http://extension.arizona.edu/pinal

Richard D. Gibson
Extension Agent, Agriculture

RDG/te/sh/aw

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Have a sick plant or just questions about caring for your plants?

Visit our Plant Diagnosis Clinic held every third Thursday of month from 9:00 am til noon at the U of A Cooperative Extension 820 E. Cottonwood Lane, Bldg. C Casa Grande, AZ 85122

Or you may call the Maricopa Agricultural Center at (520) 374-6263 and leave a message.

If you are able to email a picture, please send it with any information you can provide about the plant, and your contact information to the diagnostic team at macmastergardener@gmail.com and a Master Gardener will contact you.

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