



THE UNIVERSITY OF ARIZONA

Cooperative Extension



SEPTEMBER 2018 Garden & Landscape Newsletter

U of A Cooperative Extension, Pinal County 820 E. Cottonwood Lane, Bldg. C., Casa Grande, AZ 85122
(520) 836-5221 <http://extension.arizona.edu/pinal>

TEN SIGNS THAT A TREE IS PLANTED IN THE WRONG PLACE

Planting a tree in a location where it will fail to thrive, or where it will become a nuisance, can be a costly mistake.

Trees, shrubs and bedding plants provide many benefits to a residential landscape, including beauty, shade and a welcoming feel to outdoor living areas. A handsome, functional landscape also adds value to the home and can put extra money in the pocket when the home is sold later on. In order to maximize these benefits, it is important to properly plan, install and care for the landscape.

Unfortunately, far too many mistakes are made at planting. In horticultural terms, it is a mistake to plant a tree where soil or environmental conditions will not favor good growth, where it will eventually need regular and heavy corrective pruning or where it may need to be completely removed within a few years.



Large trees planted directly under a power line will most likely grow up into the wires and have to be heavily pruned for safety. For these locations, select a smaller tree or shrub whose branches at maturity will not extend into the lines.

Heavy corrective pruning destroys the natural form and beauty of the tree and opens it up to possible infection by plant disease organisms and insect pests. Removing and replacing a tree results in the loss of the plant's immediate value. It also means a loss of the valuable time required to bring the tree to maturity. By taking the time to do the project right the first time, the owner or manager of a valuable landscape can save both time and money.

Here are ten common signs that a tree has been planted in the wrong place. If you are getting ready to install a landscape, a good first step would be to take a drive or walk into any residential or commercial area and learn to recognize these mistakes. Then, as you plan your landscape, make sure that they do not show up in your yard.

Sign number one: the tree is growing into a power line. Tree limbs growing into electrical lines strung from power poles can be dangerous hazards to people and property. Maintenance crews regularly trim out branches that grow into and around these lines. Trees that have been trimmed for safety often have their natural form, and their value, either seriously damaged or destroyed. Many times these trees end up being removed completely. When siting a tree, place it in a location where it will grow in its natural form without danger of growing into power lines.

TEN SIGNS ... CONTINUED ON PAGE 2

IN THIS ISSUE:

TEN SIGNS THAT A TREE IS PLANTED IN THE WRONG PLACE	1
MESOPHYLL COLLAPSE	3
PREPARE FOR THE FALL GARDEN SEASON	5
GETTING TO KNOW THE PARKINSONIA TREES	7

TEN SIGNS ... CONTINUED FROM PAGE 1

Sign number two: the tree branches grow into the street. Planting a tree too close to the street will cause the tree eventually to spread its branches into a place where bicycle, car, and truck traffic will either hit, or swerve around, the branches. In either case, the tree becomes a safety hazard that will need to be severely pruned or removed.

Sign number three: the tree limbs and branches grow over the fence into the neighbor's yard. If the neighbor doesn't mind the tree or the shade that the tree provides, this may not be a problem. More frequently than not, however, the people next door would prefer that a tree not invade their space. The hassles, problems and potential conflicts that could occur are easily avoided by planting the tree in a location where it will not cross property boundaries.

Sign number four: the tree branches rub on the exterior walls or the roof of the house. Branches blowing too and fro in the wind can scrape and damage brick, paneled, or stucco walls. They can also rip asphalt shingles or break tiles on the roof. Plant the tree away from the home to avoid expensive repairs.

Sign number five: the trees grow into each other. Trees planted too close together compete for water, air, nutrients and sunlight. A lack of proper nutrition or sunlight will often stunt plants and weaken their trunks and branches. Branches that cross and rub against each other can easily be damaged and ruined.

Sign number six: the tree is damaging water, sewer, or natural gas lines. Some trees have aggressive, fast-growing roots that can overpower and damage underground utility lines. Sewer pipes are particularly vulnerable, for example, to the invasion of mulberry tree roots. Depending upon the type of line, the damage can range from a mere frustration to one of real danger. It is important to know where the lines are on the property, and avoid them.

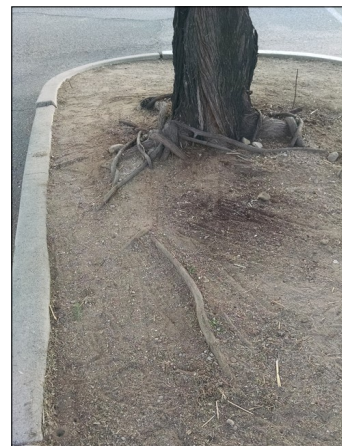
Sign number seven: the trees shade out lawns and flower beds and make them unproductive. Dense shade from large trees will often prevent lawn grasses, bedding plants, shrubs, vines and other trees from properly growing as they shade out their smaller competitors.

Sign number eight: the tree is in a place where it can heave and buckle sidewalks and fences. The roots of large trees, if they grow too close to the surface of the soil, can push up sidewalks and fences. This type of structural damage can be difficult, as well as expensive, to repair.

Sign number nine: a caliche layer or structural hard spot in the soil causes the roots of trees to grow up close to the surface of the soil. Shallow, improperly rooted trees can more easily blow over in a windstorm. This problem can be avoided by checking the percolation of water through the soil prior to planting and by properly preparing the planting hole.

Sign number ten: the tree cannot be properly irrigated in a timely manner because water on the property is unavailable or is too expensive for the budget of the person paying the water bill. Trees will become seriously damaged, or even die, if they do not receive the proper amount of water during the growing season.

Planting a tree in the wrong location is one of the more obvious and expensive mistakes that is all too commonly made during landscape planning and installation. By taking the time to plan and install trees properly, major landscape mistakes can be avoided. This will result in savings of both time and money.



Roots that grow above the surface of the soil often indicate a soil problem. At planting it is important to properly prepare the soil and avoid potential problems.

MESOPHYLL COLLAPSE

If you own a citrus tree, most likely you are familiar with and possibly have wondered about mesophyll collapse.

The mesophyll of a leaf, any leaf, is a hard working section that fits between a layer of cells top and bottom called the epidermis. The epidermis plays a key role in leaf health. It keeps out that which is supposed to stay out, like disease organisms, dust, insects, and the like. It also keeps in that which should be kept in, such as water, nutrients, and smaller structures in the cells. In between the upper and lower epidermal layers is the mesophyll, or that part of the leaf that is in the middle (meso) of the leaf (phyll).

You may now be saying to yourself, “So what?” Well, the center part of the leaf, the mesophyll, is the place where a lot of the factory work takes place in the plant. The chlorophyll, the chemistry that captures sunlight energy and transforms it into food materials, is found inside structures called chloroplasts that are found principally, you guessed it, in the mesophyll. A vast majority of the energy from photosynthesis is assembled here.

Additionally, the movement of water within the plant is driven by processes within the inner part of the leaf. Critical enzymes, hormones, and lots of other essential compounds are created, stored, and used in the leaves. For these reasons alone, the center part of leaves is absolutely essential to the proper growth and development of plants. Sick leaves are never good for the plant.

The mesophyll is composed of cells arranged in different ways. Towards the top of the leaf, there is a layer of cylindrical cells that are stacked on top of each other. In some leaves there may be only one layer of these cells. In other leaves there may be two or more layers depending upon the location of the leaf on the plant. Leaves that are primarily in the sun during the day, sun leaves they are called, may have multiple layers of these cells. Leaves primarily in the shade, the shade leaves, may only have a single layer of such cells.

This top layer of cells that are longer than they are wide make up the “palisade” layer. Most of the chloroplasts are found in this layer of the leaf. The palisade layer cells lie relatively close together to provide strength to the leaf but are separated from each other slightly so that carbon dioxide entering the leaf from the atmosphere can have ready access to the chloroplasts. The palisade layer is easier for me to understand if I think about the vertical wooden poles of a log fort standing up next to each other. Close together for protection and support, the logs are also separated by a small space in between.

It is the palisade layer that helps the leaf stay oriented towards the sun. As long as the cells have access to plenty of water, the cells stay rigid and tight. If the cells face a water shortage for some reason, that is, more water goes out of the plant than comes in through the roots, then the cells tend to shrink a little. This results in the familiar “wilting leaf” symptom.

Underneath the palisade layer is the “spongy” cell layer. The spongy layer is best described and understood by remembering the inner structure of a kitchen sponge. In a sponge, pockets of air are surrounded by stacks and strands of solid material. The hollow spaces hold water and the solid material gives form to the sponge.

So it is inside the spongy layer in leaves. Hollow pockets surrounded by cells mainly contain air, although some water adheres to the sides of the pockets. The spongy layer cells do contain some chlorophyll for photosynthesis but not as much as is found in the upper palisade layer. It is through the hollow spaces that air rich in carbon dioxide moves into the vicinity of the chloroplasts. Likewise, the waste product of photosynthesis, oxygen, drifts through the air pockets towards the outside. Connecting with the cavities in the spongy layer are tiny holes in the lower epidermis called stomata which allow carbon dioxide in and oxygen out.

- MESOPHYLL COLLAPSE . . . CONTINUED ON PAGE 4

MESOPHYLL COLLAPSE . . . CONTINUED FROM PG.3

We cannot forget to discuss the importance of the mesophyll in transpiration. Transpiration is the main driver of water movement through the plant and it is principle mechanism for keeping the tender leaves cool in hot weather.

Transpiration occurs when water and nutrients are captured from the soil by the roots, ushered up to the top of the plant through the stems, trunks, and branches, and finally end up in the leaves. Inside the leaves, the water evaporates inside the hollow spaces of the spongy layer and exits through the holes. Because water molecules tend to stick together in the liquid state, they tend to pull each other up as they move. When one molecule of water evaporates into the air, the next molecule is pulled towards the air pocket. As molecule after molecule evaporates, the net effect is the gradual movement water throughout the plant.

With just this brief and simplified overview of what is happening inside the leaf, it is easy to see that protection of the leaves, the mesophyll especially, is critical to the long term health of the plant. Any damage to these tender tissues will slow or stop production of food, plant growth and development, and the cooling effect of water evaporation.

When the center parts of the leaf die, the cells tend to dry out, shrink in size, and turn a different color than the healthy green we desire. Leaf color changes can range from yellow to orange and the affected areas usually result eventually in sunken brown spots that most commonly are found at the edge of the leaves. Sometimes the dead or dying areas are mere speckles but sometimes they can take up most of the leaf. These dead areas can also be found in the middle of the leaf. The term we use to describe all of these symptoms is mesophyll collapse.

Mesophyll collapse is common in citrus tree leaves, especially in the late summer and early fall times of the year. However, mesophyll collapse is not just limited to citrus. Many different types of plants can be affected. All summer long, leaves have been exposed to heat, salt, sandblasting summer storms, insect attack, and a whole host of possible triggering agents while they have been dutifully working out their lives to the benefit of the tree and the fruit that it bears. As we well know, it is a tough environment out there and it is easy to imagine how damage to the soft inner leaf tissues can occur.

How do we protect our plants from leaf damage? Deep irrigations to leach out harmful levels of salts, proper timing of irrigations to provide sufficient water for the plant to cool itself throughout the summer, and good fertilizer practices will all go a long way in helping keep leaves healthy and on the job.

Fortunately, when only a few leaves are affected, the plant will usually be just fine. It is only when plants sustain major damage to the vast majority of leaves that we really begin to worry. Once the leaves are damaged, there is no getting better. We just have to wait until they are replaced later on. For that reason, it is always a good idea to head off damage before it begins to appear.

When it is all said and done, good management practices provided in a timely manner will bring peace of mind to anyone responsible for protecting the good health of trees, shrubs, and garden plants.

PREPARE FOR THE FALL GARDEN SEASON

The planting window for fall gardens will arrive next week. Are you ready to plant?

One of the first reasons people mention about why they like to grow their own garden is that fruits and vegetables straight from the garden taste much better than produce that has been sitting in refrigerated boxes or placed on a grocery shelf for a period of time. Others mention the increased nutritional value of fresh produce because they know that vitamins and minerals begin to degrade as soon as produce is harvested. The fresher the produce, the higher its nutritional value.

There are other benefits, of course. Not only are fresh vegetables tasty and nutritious, but one also knows how it was grown and treated after harvest. Plus, growing part of our own food supply gives us reassurance that we could get by if there were, for one reason or other, a breakdown in the food supply. In a recent survey in Tucson, we found individuals who said they grew 100 percent of what they eat in their backyard gardens. The average, however, was between 5 and 15 percent.

As far fetched as it might seem, there is always the possibility that a crop failure could occur from drought or plant disease. Transportation of food from the growing areas to supermarkets could be interrupted by cost of fuel or damage to the highway infrastructure. The US Department of Agriculture is well aware of, and continually planning for, bioterrorism. While all of these events are not likely, many people are not forgetting them either. A home garden, like the victory gardens of World War II, are a buffer against a weird and wacky world.

For these and other reasons, I believe that it is always a good idea to have a home grown vegetable garden. A garden does not have to be big and elaborate. It can be as simple as a planter box outside the back door. It can be in raised beds or planted directly into the native soil. In my opinion, everyone should be growing something, just for the fun of it. So drag out the gardening tools, pick your style and your spot and let's go to work! Here are a few tips that you might find helpful.

Soil preparation is critical to enjoying success in the garden. Before planting, the soil should first be well tilled with a mechanical tiller, or by spading. Make sure that all of the clods are broken up and that the soil is leveled to allow irrigation water to flow evenly between the plants.

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 be dealt with later on. It is also a good idea to add one half pound of ammonium phosphate (16-20-0) fertilizer before tilling the soil to ensure plenty of nutrients for the tender young plants once they begin to grow. I like to add my organic matter well in advance of planting to give it a chance to at least begin to breakdown and start to release into the soil the good things it carries.

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. Later it will be important that the entire root zone of established plants be flushed with sufficient water to dissolve the salts so prevalent in our desert soils and flush them down below the root zone. For most garden plants this should be between eighteen and twenty-four inches. Irrigate frequently enough to keep the plants fresh, but not so frequently that the soil stays sloppy wet all the time. The roots need oxygen from the air as much as they need water.

If you are wanting to save water and minimize your water bill, plan on using tried and proven drip irrigation technology. Most garden stores carry the parts needed to install a good drip irrigation system and can provide the knowhow so that you can do the work yourself.

PREPARE FOR THE FALL GARDEN SEASON - CONTINUED FROM PAGE 5

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.

Insect and weed pressures can be a problem during the fall garden season. Aphids and other piercing-sucking insects can be a problem. Make sure that you check your garden plants often for these pests and either wash them off with a strong stream of water or treat them with a garden insecticide. Do not use a systemic insecticide, one that is absorbed into the plant, on edible plants. You really do not want to be eating the stuff yourself, but systemic insecticides are excellent in controlling aphids on ornamental plants, like flowers.

You will need to also remove any weed seedlings early on. Do not let them hang around for long because they will end up stealing the water and nutrients from your garden plants. When they are small, at the seedling stage, they are easy to pull up by the roots or cut with a hoe or knife. Herbicides will not work well in vegetable gardens because most, like glyphosate, is broad spectrum, meaning that it will kill any plant that is green, the good and the bad. A hoe, knife or fingers are the best way to control weeds in the garden.

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 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.

Gardening does not have to be backbreaking or painstaking. With proper care and good timing, fresh, homegrown vegetables can provide a healthy addition to the dinner table. Most perceived obstacles can be easily overcome with a little know how, and, it is possible to work smarter, not harder. This will translate into fun for all ages. So, come on! Even if it is just one seed in one pot, let's plant a fall garden today!

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Jeffrey C. Silvertooth, Associate Dean & Director, Economic Development & Extension, College of Agriculture and Life Sciences, The University of Arizona. The University of Arizona is an equal opportunity, affirmative action institution. The University does not discriminate on the basis of race, color, religion, sex, national origin, age, disability, veteran status, or sexual orientation in its programs and activities.

GETTING TO KNOW THE PARKINSONIA TREES

Some of us knew them as *Cercidium*, and now they are called *Parkinsonia*, but in the end it is not the scientific name so much that counts, but what they do in the landscape that is most important.

Parkinsonia is the genus now used to scientifically name the several species of palo verde growing native in our deserts. The name is also used for palo verde relatives growing in other parts of the world. While the name is important for scientists and lay people alike to accurately describe and identify the plants, it is the use of the plants in the landscape, and their overall health, that is most important to us. Still, in order to give proper care, we really do need to call it by its correct name.

The palo verde trees can be particularly useful in developing low water use landscapes. They provide medium to full shade, which is always important in our desert environment. They use relatively little water when compared to some of our other choices, such as the ash tree. They are well adapted to our climate and soils, and they are adorned with attractive yellow flowers in the spring. Some find the discarded leaves and seed pods a challenge to clean up, especially on the uneven surfaces of gravel mulch covered yards, but most plants are going to have a downside somewhere. Nevertheless, many decide to put up with the mess just so that they can enjoy the other benefits. In any case, palo verde trees can fill an important niche in local landscapes.

It is easy to recognize them, even from a distance. They are generally medium-sized trees and they all are characterized by their striking and distinctive green bark. No other mature trees in the landscape look quite like them.

When I started learning the plants of the desert, *Cercidium* was the name used to describe the palo verde species native to our part of the Sonoran Desert. *Parkinsonia* described all the other species in Mexico and around the world. Now, scientists taxed with the responsibility to put correct names with each different type of tree have decided that they all will fit within the *Parkinsonia* designation.

There are basically four species that are most commonly used for landscaping in our area. Including the ones we know, there are a total of eleven species in this group worldwide. Most of them are found in Africa but several are native to both continents in the Americas. However, we generally focus here on the four. Let's take a look at those that are most commonly used in local landscapes. Let's also mention in passing a few of the basic characteristics for each plant.

First off there is *Parkinsonia aculeata*, the Mexican palo verde tree. This was one of the first species to be listed under the *Parkinsonia* name. It can grow up to thirty-five feet in height and about the same spread. It can be a huge tree and may not be a good fit for those with a smaller yard. It has smooth green bark on the small twigs and branches but down on the lower trunk and large branches the bark takes on a gray-brown color. It is probably the most frost tender of the several palo verde trees, but in our climate it does just fine. It is armed with spines that seem to offend more than its cousins so many people choose to avoid planting it in high traffic areas. While it is capable of surviving with less water, this tree does better with a regular deep irrigation.

I absolutely love the blue palo verde tree, *Parkinsonia floridum*. Growing up to thirty feet tall and about the same spread, it can be a majestic center piece for the yard. The bluish-tinged green bark is absolutely gorgeous and serves as a real treat for those who can tell it from its cousins. The bark of the lower trunk in older trees may be gray in color.

The blue palo verde is native to the Mohave Desert, and the Sonoran Desert in southern Arizona, California, Sonora, Sinaloa, and Baja California. It is also well adapted to our local conditions and there are many planted in our Pinal County communities. Because the canopy of the tree is somewhat more dense than its relatives, the shade underneath the tree may also be more dense. If you are looking for a low water use shade tree, the blue palo verde may be just the ticket.

The most common of the palo verde trees in our area is *Parkinsonia microphyllum*, the foothills or littleleaf palo verde. Both common names are descriptive. When you walk in the desert here locally, this is the palo verde that you will most commonly find. Because of its complete adaptation to our particular desert environment, it can be planted in landscapes

PARKINSONIA TREES . . CONTINUED ON PAGE 8

PARKINSONIA TREES . . . CONTINUED FROM PAGE 7

with full assurance that there will not be a lot of problems that it cannot handle.

Another interesting palo verde tree, the palo brea or *Parkinsonia praecox*, is native from northwest Mexico to Peru and Argentina. The tree will grow to thirty feet tall and about twenty-five feet wide at maturity. Most have a relatively short trunk and long, upright branches. This branch arrangement gives the tree an interesting and appealing appearance that many may find attractive in a desert landscape. The tree's bark is generally lime green in color.

The palo brea prefers full sun and will take reflected light. With deep irrigations it will only need to be watered every one to two months while it is still young. At maturity, it may only need to be irrigated during long summer droughts. It is somewhat sensitive to hard frost events and may need to be planted in a protected location or placed in a location that will allow easy access and covering during cold weather.

All palo verde trees are susceptible to, and sometimes plagued by, mistletoe and desert prionid beetle larvae. The latter are sometimes called, "palo verde root borer." These challenges can be difficult for the trees and require attention to detail, but good pruning habits along with good irrigation practices can often prevent a problems before they ever become obvious. As legume trees, they have the capacity to extract nitrogen from the air, and so well adapted are they to the desert, they do not need to be fertilized like non-legume other trees.

The palo verde trees so commonly planted in our landscapes and medians are wonderful examples of low water use, desert-adapted trees and shrubs that fill an important niche in our landscape plant palette. Knowing them personally, and how to best care for them, can help determine how successful they will be as landscape plants.

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

59 mailed copies

262 emailed

How to connect with **Rick Gibson** online...



Blog: *Booming Deserts*

ricksgardenspot.blogspot.com



Facebook:

<https://www.facebook.com/PinalCountyGardenandLandscapeProgram>



Twitter: <https://twitter.com/RickGibson4>