



# Pinal County Cooperative Extension Garden & Landscape Newsletter January 2009



## GROWING HEALTHY, SUCCESSFUL TREES AND SHRUBS

The winter months are the time to plant bareroot trees. It is also a good time to plant potted trees and shrubs, if care is given to frost and freeze protection.

Healthy trees and shrubs are a valuable addition to any landscape, but any hope of maintaining them in good condition over long periods of time is entirely dependent upon the care that they receive. Two of the very first keys for developing successful landscape plants are the selection and planting of good stock.

Selection of good, quality plants before planting is absolutely critical to the long term health and development of trees and shrubs. A plant that has inherent weaknesses or health problems at planting really has a low chance of survival to maturity. Improper planting techniques can add additional problems that may tip the balance against even otherwise healthy plants.

Look for bareroot trees that have a strong root system and whose roots have been protected from drying. Bareroot trees whose roots have been exposed to the drying air, have twigs or roots that are obviously dead or have other obvious weaknesses should be avoided.

When selecting potted or boxed trees, treat the plants just like you would a used car. What is the history of the plant? How long has it been in the container? Does the plant have any obvious defects? Most people do not purchase a car unless they have checked on the parts that are not readily seen. The same is true of plants.

Two major weaknesses that are not easy to see are girdling and kinked roots. Girdling roots are roots that loop around the root ball and encircle the trunk of the tree. Girdling roots can actually be enveloped into the trunk proper as the tree grows causing the trunk to become weakened and constricted. Just as a snake which envelopes and squeezes the life from its prey, girdling roots can slowly but surely squeeze the life from growing plants.

Kinked roots are roots that make quick turns in one direction or another. Sometimes these roots will double back on themselves and then grow in a direction that is at a wide angle from the original direction of growth. Just like a kinked water hose, kinked roots have difficulty in moving fluids from one part of the plant to another. This often results in stunted, weak plants that can quickly die, especially in the early years of growth.

Girdling and kinked roots occur when a plant outgrows its pot. When the roots grow to the edge of the container, because they can not grow through the barrier, they either turn to begin the long circle around the edge of the pot, or they double back in the direction from whence they came. Plants left too long in a container that is too small for the root system will often have girdled and kinked roots. Because a strong, wide and deep root system is critical for physical support of the tree, these problems must either be avoided or corrected at the time of planting.

—HEALTHY TREES... Continued on Page 7

### IN THIS ISSUE:

<b>GROWING HEALTHY, SUCCESSFUL TREES AND SHRUBS</b>	<b>1</b>
<b>MANAGING AND MAINTAINING A DRIP IRRIGATION SYSTEM</b>	<b>2</b>
<b>ALLEPO PINE BLIGHT</b>	<b>3</b>
<b>BOYCE THOMPSON ARBORETUM, A GREAT PLACE TO VISIT</b>	<b>4</b>

## MANAGING AND MAINTAINING A DRIP IRRIGATION SYSTEM

If you have a drip irrigation system, January is a good time to perform regular maintenance chores and make any needed repairs.

The cooler months of the year are a good time to work on drip irrigation systems because 1) the plants demand less water when its cool, 2) the leaves are off of our deciduous plants and we can see the system better and, 3) the cool weather is much more pleasant for us to work in than the 100 plus degree weather of June and July, the time when we usually find drip system problems. A little extra attention now can save us a lot of grief later on.

During the cooler times of the year, outdoor plants tend to go into a resting stage in their growth cycle. Some trees, like the fig and mulberry, lose their leaves for a time while others simply stop growing. During these times, all outdoor plants tend to use less water. Because of this, January is a great time to make any additions or repairs to a drip system. Even if the work extends over several days, the down time required when the system is not working will generally not affect the health or well being of the plants.

Properly designed and managed, drip irrigation systems deliver the proper amounts life-giving water to the root zones of plants. When everything works as it should, plants flourish. When the system does not work properly, well, let's just say that problems can arise.

In order for any plant to be healthy, there must be a balance of energy between the top part of the plant and the bottom part of the plant. Stated another way, there must be sufficient strength stored in the roots to support the activity of the leaves and other above ground parts of the plant, and there must be enough energy generated in the leaves to support the function of the roots. When any plant goes out of balance, for whatever reason, serious problems can occur.

When root systems die back because of disease or lack of water, the total volume of roots that previously supported the top growth

of the plant decreases. A typical response to this condition that is commonly seen in the tops of large trees and shrubs is a general loss of leaves, and even the death of some twigs and branches in severe situations.

In most cases, the appearance of these types of symptoms is a fairly accurate sign that the roots are, for one reason or another, not getting enough water. If a drip system is being used, and if every part of the system is functioning properly, it may be an indication that the emitters are improperly placed.

It is a good idea to look at the growth patterns of all plants at least once a year. Most of the small feeder roots that do the work of absorbing nutrients and water from the soil will be within the area between the trunk and the outer reach of the plant's branches. In order for the tree or shrub to pick up sufficient water to maintain its life functions, it is important to wet as much of the soil where these roots are found as possible

Start by checking the locations of all emitters on the system and determine if sufficient area underneath the plant is being irrigated. If plants have outgrown the number of emitters present, it will be necessary to add emitters.

Another important task is make sure that the drip system filter is cleaned at least twice a year. To check the filter, open the filter canister and visually inspect the filter. If it is clogged, rinse or scrub it lightly until it is clean. The entire system needs to be flushed out twice a year. To flush out a drip system, simply remove the end cap closest to the valve and let the system run for thirty seconds, then put the cap back on. Work your way through the system until all lines have been flushed.

Another important key to properly maintaining a drip irrigation system is to check the equipment regularly while the system is running. Danger signs include puddling of water on the surface of the soil or the presence of wilted or fallen leaves. Either of these may be an indication of

—**DRIP SYSTEM...** Continued on Page 6

## ALEPPO PINE BLIGHT

We are beginning to see browning of Aleppo pine branch tips on some trees throughout the area. This is a common occurrence about this time of year and I hope to reassure you that, in most cases, there is nothing to worry about.

Aleppo pines can start to look pretty ragged this time of year with brown patches scattered throughout the tree canopy. In most cases, this is a reversible condition that should get better later in the year as temperatures warm. The effect can often be minimized by making sure that the tree gets good care.

The Aleppo pine is a good choice for the low desert areas of Southern Arizona because it is well adapted to our harsh climate and alkaline soils. It attracts few, if any insect pests and it has no major diseases to shorten its life. It is a fast-growing tree and it provides good shade for our hot, summer days. It has been, and continues to be, a landscape stalwart in this area.

It does, however, have one disconcerting tendency. The needles close to the tips of some branches during the cool winter months can turn an unsightly brown. Sometimes the needles stay flexible and turn green again as the weather warms. Sometimes the needles will actually die, turn brittle and fall off; but the twigs and branches that support the needles usually stay green and will eventually regrow new needles.

The browning condition is referred to as Aleppo pine blight. The disease is not caused by fungi, bacteria or insects. It is a weather-induced shock to tender, actively growing needles at the tips of the branches. Since not every branch of the tree is affected, the browning effect gives the tree a part-green, part brown appearance that can lead one not familiar with the condition to believe that the tree is dying. In reality trees rarely, if ever, die of Aleppo pine blight.

With all of the publicity currently being given to the bark beetle devastation in Northern Arizona pine forests, it is logical to assume that the browning of Aleppo pines is somehow related to these beetles. You can ease your minds on that matter.

First of all, the bark beetles of Northern Arizona do not like the desert climate. It is too hot here for them. Second, if the damage now seen in Aleppo pines were caused by bark beetles, the twigs and branches would not remain green to produce new needles in the spring. Third, the damage would not be spotty on the tree. Bark beetles cause a rapid decline and eventual death of the entire tree.

While the specific cause of Aleppo pine blight is still unclear, there are a couple of theories that have been proposed. One states that the effect develops when there is not enough time between warm and cold weather in the fall and winter to allow sufficient winter dormancy to develop. Certainly, the variable weather that we have been experiencing in past years lends support to this theory. One week, the fall temperatures can be in the eighties and nineties; the next in the low forties and even in the thirties. This transition is hard on plants.

Another theory blames the browning of the needles on a previous stress for water and nutrients. Most plants under stress often shut down part or all of the plant for a time until conditions for growth and development are better. A good example of this is the ocotillo. When warm, dry weather arrives, the ocotillo sheds its tender leaves and goes to sleep. Once the rains come again, the plant reawakens, puts on new leaves and begins a new growth cycle. Aleppo pine blight may be an example of a similar response by the Aleppo pine. The tree may simply not have enough strength to support the many needles on all of the branches of the tree, and the browning may be a move by the tree to cut back to what it can sustain.

Symptoms of Aleppo pine blight are noticeably striking. Affected foliage suddenly dehydrates, turns whitish green, then brown, usually in the cool months of the year. A few green needles or parts of an individual needle may survive in the midst of the blighted ones. Some defoliation may occur and tree sap may sometimes seep from the blighted twigs. In the more severe cases, some twig die-back may actually result.

**-ALEPPO PINE BLIGHT...** Continued on Page 5

## BOYCE THOMPSON ARBORETUM, A GREAT PLACE TO VISIT

If you are looking for a great place to learn more about desert-adapted, low water use plants; consider visiting the Boyce Thompson Arboretum, near Superior.

The Arboretum features a great collection of desert plants from all over the world. Viewing their collections is a good way to get ideas for our own landscapes. They also present classes to help us understand more about the world in which we live. Always a top quality experience, the Arboretum is a good place to go for fun, renewal and learning.

Located just 45 minutes east of Mesa, the Arboretum is an Arizona State Park that is cooperatively managed with the University of Arizona. Founded in 1925 and dedicated to instilling in people an appreciation for plants, this 323 acre botanical collection includes a wide range of habitats along nearly two miles of paths.

Many Arizona residents have come to love the cactus gardens, the Australian forest of towering Eucalyptus trees and the fragrant varieties of the herb garden which are only a few of the many displays that can inspire, awe and encourage the plant enthusiast. I have been there many times and still come away with a greater appreciation for the desert-adapted plants that can enrich our landscapes and our lives.

If you go, take time to stroll through the collection of 3,200 different desert plants unique to the desert, where exotic species from around the world thrive alongside native Sonoran Desert plants. Short trails lead through the Sonoran and Chihuahuan desert areas, a cactus garden, several rich riparian areas, an Australian forest, and the herb and rose gardens. English, Spanish, French, German and Japanese trail guides are available for the scenic 1.5 mile loop through Queen Creek Canyon; handouts offer additional information on many of the other trails and gardens.

Begin your tour at the Visitor Center, where an eight minute video offers a brief history of the

park and a preview of what's in store along the trails. This building also houses a bookstore and, of course, a wide variety of cacti, succulents and leafy plants which are available for purchase.

The cooling tower exhibit at the visitor center creates a cool microclimate; its 30 foot tower functions as a giant evaporative cooler. For those who appreciate what it takes to keep a building cool during the summer, this is a must see!

Several trails branch off from the first part of the Main Trail, so you don't have to walk far to see the highlights, and much of the trail system is wheelchair accessible. The Curandero/Sonoran Desert Trail showcases traditional herbal medicines of the Sonoran Desert. Curanderos are traditional healers in Mexico.

The historic Smith building, a short walk down the main trail, contains botanical exhibits and displays; and two display greenhouses feature cacti and other succulents that might not otherwise survive winter cold at the parks 2,400 foot elevation. The Smith Interpretive Center, between the display greenhouses, has exhibits on plants and the natural history of this corner of Arizona.

For the serious landscaper or gardener, the Arboretum is an ideal place to purchase unique plants. Many of the same mature plant species that are on display in the park can also be purchased on site. Many people get new landscaping ideas from the 2.5 acre Demonstration Garden. It shows various plants in the context of a functional landscape, complete with patios, walls, shade structures, vine arbors, walkways, and rockwork. Interpretive signs help guide the homeowner through the processes of site analysis, basic design and plant selection, while introducing important concepts such as water harvesting, the mini oasis and the challenges of salinity.

Forming a scenic backdrop and towering over the property at an elevation of 4,400 feet is nearby

—BOYCE THOMPSON... Continued on Page 5

## **-ALLEPO PINE BLIGHT...** Cont. from Page 3

The blight may be triggered in part by night-day temperature extremes and drying winds, since the symptoms usually show up on the sun-exposed, windward tops and sides of the trees. Most affected branches survive this peculiar affliction and readily replace the brown needles in late spring and early summer as the trees begin their new growing season.

A good way to diagnose this particular problem is to bend the affected needles and twigs. If the needles and twigs are brown beneath the bark and become brittle so that they snap easily, it may be that the tree is experiencing dehydration and death of some of its parts due to severe water stress and heat injury. If the needles are still flexible, or only a few are brittle, the problem may simply be the blight.

While the symptoms of Aleppo pine blight may never be completely eradicated, there are a few steps that can be taken to ease the problem in most trees. Make sure that the tree gets at least a monthly deep irrigation throughout the entire root zone of the tree and apply a nitrogen fertilizer at least twice a year to support new growth.

There is a slight chance that browning of needles and death of twigs may be related to a more serious disorder, such as root rot generally associated with too much water, but that condition is rare. It is important, whenever there is a condition of which we are not sure, to always be vigilant and watch for signs that the problem is getting worse. The Aleppo, however, is a pretty resilient plant and usually does not give its owners too much to worry about.

## **-BOYCE THOMPSON...**Continued from Page 4

Picketpost Mountain. While there is no public access from the arboretum trails, there is information available at the park about this historic area where a heliograph station, equipped with mirrors to flash the rays of the sun, operated atop its peak during the Apache wars of the 19th century.

More than 200 species of birds and 72 terrestrial animals have been seen about the grounds. Ayer Lake, and Queen Creek on the Main Trail, are good places to watch for wildlife; and you may even see endangered species such as the Gila topminnow and desert pupfish.

Special annual events include Spring and Fall Landscaping Festivals for two weeks each March and October, the Fall Color Festival, Australia Day, Herb Festival, World Desert Fair, Welcome Back Buzzards and more.

A shaded picnic area equipped with charcoal grills and near the main parking lot is available to visitors. So pack a lunch and take a drive to Boyce Thompson Arboretum, which was voted "Best Fall Day Trip For the Family" in the New Times Best of Phoenix readers' poll. It may be the best trip of the year!

Boyce Thompson Arboretum is open daily (except Christmas) from 8 am to 5 pm. Admission is \$7.50 for adults, \$3 children age 5 -12 and free to the younger kids.

The arboretum is situated at Highway 60 milepost 223, just three miles west of Superior, 45 miles east of Mesa. Visit their website at [arboretum.ag.arizona.edu](http://arboretum.ag.arizona.edu) or call (520) 689-2811 for additional information.

## **-DRIP SYSTEM,** Continued from Page 2

broken or clogged lines or plugged emitters. If leaks are found, repair them right away.

Some leaks in drip system lines may actually be caused by small animals in search of a drink of water. Gophers, rabbits and other animals frequently will chew on tubing above or below ground until it punctures and then enjoy the water fountain that springs from the system.

Do not forget to adjust the irrigation schedule on a monthly basis. Plants require and use more water during the warm months than they do in either the spring or fall. The hotter the weather, the more water plants will need. The cooler the weather, the less water plants will need. These water demands are best met by adjusting the frequency of irrigations, not the timing.

Let me explain what I mean. When water is applied to soil, it sinks in to a depth that is determined by the percentage of sand, silt and clay in the soil; the chemical balance of sodium, calcium and magnesium; the length of time that water is allowed to run; and other factors. Every soil is different and it is impossible for me, or anyone unfamiliar with your soil to tell you how long to run your system without some trial and error. Once that length of time is determined, however, it is best not to mess with it.

Because different plants have different rooting depths, the drip system should be set to water specifically for each plant's needs. Lawns, flowers and vegetables should be irrigated to between one foot and eighteen inches deep at each irrigation. Small shrubs and groundcovers should be irrigated to about two feet deep while water to the roots of trees should penetrate to at least three feet. In any landscape, plants can be damaged either by too much or not enough water. Desert adapted plants may need less water while others may need more.

The depth of water penetration is easily checked with a hand probe. Approximately thirty minutes after an irrigation, push a screwdriver or long metal rod into the soil to test how deep the water has descended. The probe will stop when it reaches dry soil. Then, mark the location on the probe with tape or fingers before removing the

probe from the soil. The depth of water penetration will be determined by the distance from the tip of the probe to the mark.

Since we do not change the length of time the system runs, in order to adjust the amount of water applied to meet seasonal demands, we have to change the frequency of irrigations, that is, the number of times the drip system runs. That can be done by adjusting when the irrigation system turns on. As the seasons change and temperatures cool down or heat up, we must shorten or lengthen the intervals between irrigations.

To determine irrigation frequency, it is essential to check the moisture levels of the soil about six inches below the soil's surface just before the next time we expect to irrigate. When a small sample of soil is squeezed in the palm of the hand, if the soil forms a firm ball and feels moist, hold off on irrigating. If, on the other hand, the soil forms a weak ball and feels only slightly damp, it is time to turn on the system. By frequently evaluating soil moisture levels, you will eventually come to know without checking when to irrigate. In the winter time, when plants use relatively little water, the interval between irrigations may well be several weeks. During summer months, the system may need to run every day or so. You need to decide what is best for your plants.

January is a great time to enjoy the cool weather, enjoy our outdoor living spaces and rejuvenate before the hot weather that will come soon enough. Checking out our drip irrigations systems may seem to take time away from those goals, but a little preventative maintenance now may save us a lot of grief later on.

## **-HEALTHY TREES...**Cont. from Page 1

---

Sometimes kinked or girdling roots are visible on the soil surface in the containers but more often than not, these problems will not be immediately apparent. Check for root problems before purchasing the plant by gently but firmly moving the trunk of the tree back and forth in the pot. Make sure to keep the container stationary. If girdling roots are present, you will likely see the soil heave or move in the same diameter and shape of the girdling roots.

Before planting and after the container has been removed, check the exposed roots near the edge of the root ball for signs of sudden changes of root direction. Sometimes it can be helpful to use hard sprays of water to remove a small quantity of soil. The water is much less likely to damage the tender feeder roots than a hard tool like a shovel or a hand trowel. Removing a small amount of soil will provide a better view of conditions just under the soil surface.

If girdling roots are encountered, consider taking the plant back to its source. If this is not possible, reclaim the plant by cutting the root off cleanly just before the point in which it makes its radical turn. A sharp clean cut is very important because a shredded or mashed root is much more likely to die back after pruning. It will also be less likely to send out new roots to replace those which were cut off. Hand shears are an ideal tool but occasionally larger loppers or a saw may be needed.

Proper planting is also critical to long term plant health. When planting, ensure that the hole is wider than it is deep and that the hole is no deeper than the depth of the soil in the container. It is no longer considered essential to dig a deep hole for drainage because the settling of soil after planting will often drag the tree deeper into the soil. This exposes tender trunk tissue that should be well in the air to avoid soilborne plant disease microbes.

If you have questions, you can reach one of the Master Gardeners at the Cooperative Extension office, 820 E. Cottonwood Lane, Building C, in Casa Grande. The telephone is (520) 836-5221. The author's email address is [gibsonrd@ag.arizona.edu](mailto:gibsonrd@ag.arizona.edu)

If you wish to have this newsletter emailed to you, please email Theresa at [tellswor@ag.arizona.edu](mailto:tellswor@ag.arizona.edu) and include *G&L Newsletter* in the subject line. This newsletter is also available to view on our website at: [www.cals.arizona.edu/pinal](http://www.cals.arizona.edu/pinal).



Richard D. Gibson  
Extension Agent, Agriculture

RDG/te  
644 copies