

THE UNIVERSITY OF ARIZONA Cooperative Extension

MARCH 2019 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

USE WISTERIA AS A COLORFUL, CLIMBING VINE

If you are looking for color in your landscape, wisteria could be a good choice.

Sometimes the landscape demands a colorful, tree, shrub, or climbing vine that catches the eye and provides shade in that outdoor hot spot. There are many choices, of course, but one of the most spectacular is wisteria. It is also easy to grow.

If you are familiar with wisteria, you will know what I am talking about. If you are not familiar, then you are in for a treat because a wisteria in full bloom is truly spectacular. These plants all have large green leaves that, when grown as a tree or a vine, can quickly produce a lot of shade. Nevertheless, it is the flowers that generally capture the most attention.

Because wisteria is part of the pea family, the flowers are all irregular in shape with a large keel petal below, a hooded petal above, and two wings on either side. In other words, it looks like, well, a pea flower. The colors vary with the variety but for me it is the violet and deep blue forms that really get my attention. Other varieties can sport white, pink, or lavender flowers. All of the colors are attractive and eye catching, so flower color pretty much will depend upon your personal preference. My favorites just happen to be the purples and blues.

The flowers are arranged in large clusters that, when the plant is in full bloom, create a feeling that you are looking at a colorful waterfall as the flowers descend in a cascade of color. In fact, there are generally so many flower clusters that your senses can easily go into color overload. It seems almost too good to be true. The massive number of flower clusters, together with the color of the flowers, make the wisteria an eye-catching addition to any landscape.

There are some caveats, of course. Very few plants are perfect in every way for every person and for every situation. However, in my opinion, the few points of wisteria that some might think are deal killers could for others be less of a concern as they think about the many good points that the plant can bring to the landscape. Before you go out and buy one for your yard though, you may want to give the following points careful consideration.

First and foremost, it will take a little more water than what you normally give your low water use plants. To keep these plants happy, they will need a regular drink of water. Shorting a wisteria for water could lead to plant damage and/or eventual death.

While we are on that topic, please do not place a plant with a high water demand on the same irrigation line as a low water use plant. Planting a wisteria by a saguaro, for example, would not be a good idea because the irrigation system operator

USE WISTERIA AS A COLORFUL, CLIMBING VINE ... CONTINUED ON PAGE 2

IN THIS ISSUE:	
Use Wisteria as a Colorful, Climbing Vine	1
UNDERSTANDING PLANT GROWTH AND DEVELOPMENT	3
Avoid Constricted Root Systems in the Trees and Shrubs	5
Selecting an Irrigation System	7

USE WISTERIA AS A COLORFUL, CLIMBING VINE ... CONTINUED FROM PAGE 1

would either be shorting the wisteria to protect the cactus or over irrigating the saguaro to provide for the needs of the wisteria. By putting both on the same line, one or the other could eventually end up dead. Low water use and high water use plants definitely have to be kept well away from each other in the landscape because the roots of the plants often intermingle in the same soil profile and compete for the same water stored in the soil. Separating high water use plants from low water use plants by placing them at some distance from each other helps keep the competition down and makes it easier to give each plant the amount of water that they need.

Another caveat is the amount of flowers produced by the plant. "Wait a minute," you say. "You just said that was the most spectacular part of the plant!" Yes, it is.

The challenge comes when the flowers mature, dry up, and fall from the plant. There are so many that, with a little wind, they can end up in a windrow of debris. However, with that said, it is important to know that they are light and easy to corral. That makes them easy to pick up and put in the trash. Some people, however, find them useful as a mulch, or as part of a compost pile. If you do not want to deal with litter, wisteria may not be a good choice for you. If you see the fallen flowers as organic gold, this feature of wisteria becomes a plus.

With those two challenges behind us, the rest is quite easy. Wisteria, as part of the pea family, is a legume plant. You can tell that not only by the shape of the flower but also by the long seed pod that forms later on. It looks much like a pea pod, which is helpful in identifying the plant as a member of the pea family. As a legume, the plant has the capability to pull its own nitrogen from the air, a major nutritional need of all plants. In other words, given normal growth, wisteria will not need to be fertilized during the year. That is good news, isn't it?

There are three species of wisteria that are commonly used as landscape plants, silky wisteria, Japanese wisteria, and Chinese wisteria. Each have their good points and each can grow and flourish here in the desert. Within the species, there are many varieties that provide for a diversity of opportunity to create an unique and attractive landscape.

The silky wisteria, *Wisteria brachybotrys*, has leaves that are divided into nine to thirteen leaflets and white flowers. The cluster of flowers is fairly short but the flowers are large, showy, and fragrant. The flowers in the species open all at once as leaves begin to bud out on the tree. There is a variety of the silky wisteria, 'Violacea,' that has purple flowers.

W. floribunda is the Japanese wisteria. The leaves are divided into fifteen to nineteen leaflets. The plant produces long clusters of violet, violet-blue, white, pink, or lavender flowers. The flowers appear just as the plant leafs out in the spring.

The last species, *W. sinensis*, is commonly called the Chinese wisteria. The leaves are divided into seven to thirteen leaflets with the flowers appearing before the leaves pop out in the spring. The flowers are violet-blue and are only slightly fragrant. The plant seems to do as well growing in partial shade as it does in full sun.

Wisteria species can be trained as trees, shrubs, or vines. That makes them adaptable to most places in the landscape. They can be trained to a tree form by selecting a vigorous stem and then pinching off new growth from the sides of the stem as high along the stem as you want the trunk to become. Some may prefer a multiple trunk format. If so, it is simple to allow as many new stems to grow as desired before limiting the new growth as mentioned before. If the plant only has one stem, additional stems can be encouraged by pinching the tip of the existing stem back to the point where new growth is desired. As new stems form, it will be a simple task to direct that growth into the desired form. For a vine plant, attach the stems to a trellis or some other solid structure, and then train the stems up the structure.

There are many types of colorful, vining plants that can fill a niche in any landscape. Wisteria is one many choose because of its color and shade potential. If you have a trellis, pergola, or other type of structure demanding something that will grow over and envelope the structure, Wisteria may be a good choice.

UNDERSTANDING PLANT GROWTH AND DEVELOPMENT

If we desire to be successful in the garden, it is essential that we understand the various parts of the plant and how they work together.

Just about everyone has the opportunity to take care of a plant or two at one time or another but without a core knowledge of the various parts of a plant, how those parts work together to support and sustain each other, and how to manage the plant overall, it is hard to keep them healthy and happy. It is pretty tough to do the right thing at the right time. Gardening success, then, is highly dependent upon a correct knowledge of the four main parts of a plant, how those individual parts support and sustain each other, and what we can do to help them in their work.

It is important to know, first off, that an individual plant is not "an island unto itself." Rather, it is intimately tied to its environment. A plant's immediate environment consists of the soil that it is growing in, the air that surrounds it leaves and roots, the sunlight that nourishes it, and the water upon which it depends for life itself.

Most plants are highly dependent upon the soil for a place to anchor its roots and as a source from which to extract water and nutrients. For that reason, a soil that is deep enough and loose enough for roots to penetrate and perform their function is essential. By understanding the soil and its nature, we can more easily focus on providing the basic needs of the plant. Shallow, compacted soils that reduce root growth are a leading cause of death to landscape plants.

Most of us understand the importance of air to the leaves of the plant. You and I need to breathe air in order to stay alive, and so do plants. They might not have lungs as we do but air around the leaves and roots is just as important. It is probably fairly easy to understand why leaves need to be exposed to air, but air around the roots may be a new concept for some. Here is how it works.

As water from an irrigation drains down into and through the soil, the water will surround and stick to the individual soil particles much like a drop of water will stick to and spread out over a kitchen counter. As gravity pulls the water down, the excess water in a healthy soil will continue to descend until all of the water is attached to a soil particle. In between the soil particles in what is called the pore spaces, there will be no water, and where there is no water, there will be air. Not only is this good for the roots, but it also limits the development of root rotting fungi which can be lethal to the plant.

Sunlight, of course, is the source of energy that is captured by the plant through photosynthesis. When those plants are shaded by overhanging plants, stripped of chlorophyll by sucking insects like aphids and whiteflies, clogged up by dust on the surface of the leaves, or any other type of damage or interference, they will be less thrifty and less healthy than plants that are kept productive through good management techniques. Without sunlight, and a plant capable of harvesting it, the outlook for a plant's survival will always be bleak.

Then, there is water. Do we need to irrigate in the desert? You better believe it. There is simply not enough rainfall at the right intervals to carry most plants from seed to flowers without an extra drink of water. It just has to happen.

Now, let's talk about the plant itself. Just about every plant has a part that is located above ground and another part that is located below ground. The shoots are found above ground and the roots below ground. I know, that is pretty basic, isn't it. Yes, it is, but, there is much more to it. Yes, much more. Let's dig a little deeper.

In the leaves are found the light-capturing factories called the chloroplasts. It is here that the chlorophyll molecules are housed. Sunlight striking the chlorophyll initiates a process where light energy transforms into chemical energy inside the plant. That chemical energy can either be used immediately, or it can be stored in the wood of the branches and roots for later use. We say that in a healthy plant, there will be just as much energy stored in the roots as in the above ground portions of the plant. This balance of energy is very important to the plant. Catastrophic loss of energy through heavy pruning, limb breakage in a storm, loss of roots, or some other reason can severely injure a plant beyond just the physical damage itself.

- PLANT GROWTH AND DEVELOPMENT . . . CONTINUED ON PAGE 4

PLANT GROWTH AND DEVELOMENT . . . CONTINUED FROM PG.3

The stems are the support system for the leaves and become a secondary support for energy production. Not only are the stems, branches, and the trunk important for giving leaves a place to work, but they are also places where energy can be stored for later use. This dual role of stems places them in a key role for plant health and success.

The flowers are the place where most reproductive activity takes place. It is in the flowers that pollen is released and captured. It is in the flower where those same pollen grains deliver their genetic material down inside the ovary of the flower. This exchange of DNA assists in the formation of an embryonic plant down in the newly developing seed. In addition, flowers are a major source of food and energy for insects and other animals.

Underneath the surface of the soil, usually out of sight and out of mind, are the roots. Their main purpose is to absorb water, air, and nutrients from the spaces between the soil particles. As mentioned before, they anchor the plant in the ground and are a source of stored energy if the plant runs short. They also are the site where some critical life-supporting chemistries are manufactured. While we cannot normally see them, they must never be forgotten.

Each of these plant parts must do their respective jobs effectively in order to sustain each other. The roots are dependent upon the leaves and stems for energy in order to keep doing their job. Likewise, the leaves are dependent upon the roots for water and nutrients. Because of this interdependence, it is important to ensure that all parts are kept healthy and strong. That becomes the main job of the gardener.

What can we best do to help our plants survive? We can irrigate correctly, by delivering the right amount of water at the right time. This will help keep the roots healthy. When they are healthy, the entire plant most likely will remain happy. In the same manner, when we fertilize correctly, we help the plant maintain its vigor and productivity by helping the roots find the right nutrients at the right time. Both of these functions are important not only to the roots, but also to the stems and leaves.

There are many other important garden tasks, of course. We speak of them often, but, when we understand the complexity of the plant, and why the many recommended tasks are important, it makes more sense to us. It helps us know why we should calendar the right tasks at the correct time in order to help the plant do its job in an efficient manner.

A basic understanding of the way a plant grows, coupled with a knowledge of the basic tasks of good plant management, should help anyone find their green thumb.

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.

AVOID CONSTRICTED ROOT SYSTEMS IN THE TREES AND SHRUBS

Small, constricted root systems are a major cause of death in landscape plants.

When summer heat, low humidity, and lack of water begin to stress trees and shrubs, plant failure is common. In many cases, the death of plants can be traced back to small, constricted root systems. The best way to ensure good plant health, especially for trees and shrubs, is to start with good plants, put them into the ground correctly, and then give them good care afterwards. Here are some tips to consider.

First, many problems experienced by plants growing under desert conditions can be avoided if we start with good quality plants. The next major hurdle is to get it planted correctly. Plants that start off weak or end up with damaged root systems, even if planted correctly, will find it tough going under desert conditions. It is much better to invest a little more time, money, and care now than it is to lose that new tree because of problems at planting.

It is absolutely essential to consider both the top of the plant and the bottom of the plant when we assess overall strength and condition. The top of the plant includes the leaves, branches, and trunk. The bottom of the plant consists of the roots. While we cannot see the roots as easily as we can see the above ground portions, it is important that we do not forget them. Out of sight must not be followed automatically by "out of mind." Both the top of the plant and the roots are important to plant health. If one is ill then we can automatically conclude that the other is also not doing well.

This is especially true when we consider energy. All plants are dependent upon energy to remain alive. You and I try to eat healthy, exercise, and do all of those recommended things that will allow us to live an energetic life. Plants are the same. While they cannot jump and move around, they must and do live on stored energy. All life functions rely on a steady supply of energy that is continually restored through photosynthesis. Where is all this energy stored? It is stored in the woody tissues, the branches, the trunk, and the roots of the plant. If the plant is stunted, that is, it has a small top and a small root system, there will be little energy stored for future use. That can have catastrophic consequences.

Small, constricted root systems are a common cause of plant failure. Not only does it affect the amount of energy that can be stored, but a constricted root system is limited in its ability to pick up water and nutrients from the soil. When the stresses of summer arrive, the ability for such a plant to survive is touch and go. If we can avoid the common causes of constricted roots, we can often ensure the long life of our landscape plants. Let's take a look at some of the reasons that plants end up with constricted roots.

The first reason starts at planting. 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.

When selecting potted or boxed trees, ask the same kind of questions that you would ask if you were purchasing 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 under the hood. The same is true of plants. A vigorous, healthy looking plant in the container will most likely have a good root system below the soil level.

Two additional reasons for weak root systems are 1) girdling roots and, 2) kinked roots. Girdling roots are those that loop around the root ball and encircle the trunk of the tree. They rarely extend themselves outside of the original planting hole but tend to remain close in next to the trunk. The resulting root system will be small and will never provide the strength the new plant needs.

Avoid Constricted Root Systems . . . Continued on Page 6

AVOID CONSTRICTED ROOT SYSTEMS - CONTINUED FROM PAGE 5

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, roots with these kinds of defects 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 can occur when a plant outgrows its pot. When the roots grow to the edge of the container, 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.

Sometimes kinked roots are caused by rough handling at planting time. Root balls that are jammed or smashed down into the hole, especially into a hole that is too small for the size of the root ball, could end up with kinked roots. Proper planting is critical for 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. Fill the hole with water and keep track of the time that it takes to empty. If water is still in the hole after four to six hours, you have a drainage problem. It could be either soil compaction, which is common, or caliche, which is a definite possibility. In either case, one can either select a new site or try to improve the drainage by digging a narrow chimney down into the soil to a layer that will accept they excess water.

One last reason for the development of constricted root systems is related to the way that water is applied to the root system. The tips of roots need to be out near the edge of the tree canopy. A root system that does not extend out at least that far will be constricted; that is, too small to sustain good energy flow within the plant. When irrigation water is applied, it is important to irrigate out to the edge of the canopy of the tree, and long enough for the water to fill the entire root system. For trees, and I am not stretching the truth here, the water must sink down into the soil to the depth of three feet. If we shallow irrigate, roots will not grow out of the wetted zone and not develop as they should. How can I know how deep my water is going? A good soil probe will help answer that question.

When we recognize that healthy trees need a large and well-balanced root system, and strive to avoid those common mistakes that cause them, it will be much easier to ensure good health and long life to our landscape trees and shrubs.

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.

SELECTING AN IRRIGATION SYSTEM

As we head into a new gardening year, there is one question that we probably should be asking ourselves: Is it time to upgrade our garden irrigation system?

When it comes down to it, irrigation is the most important gardening task facing those who would grow garden and landscape plants in the desert. I know that I am making a strong statement here, but I invite you to consider what would happen in the garden if we did not irrigate. Just about every plant that we grow would end up dead. It really doesn't matter how well we prepare the soil, or what varieties we select to plant, or even how we put the transplants or the seeds into the ground if we do not water those plants.

While our intentions may be absolutely the best, the task of irrigating our trees, shrubs, vegetable gardens, and other plants may sometimes slip a little too far down our "To Do" list. Depending upon the size of the yard, it can become a time consuming job that, especially in the heat of the summer, can become tedious and maybe even difficult. Faced with these challenges, it just might pay off in healthy plants and time saved to install or upgrade the irrigation system. Let's visit briefly about some of the more common choices that experienced gardeners use to deliver water to their plants.

The first choice, and one that is tried and true, is the "drag a hose" flood irrigation system. This is often the simplest and easiest system to use. It just means that we pull the hose to the plant needing to be watered, setting it down, and turning on the faucet. This system, of necessity, will require the construction and use of some type of berm or furrow to keep the water from running all over the place.

The problem with a "dragging the hose" system is that the person has to remember to turn the water on, and to turn the water off. Unless we have a good plan and a system to remember these two key tasks, obvious wrecks related to plant health and/or water escaping down the gutter can occur. It can also lead to a hefty water bill if we are not careful. Still, this system offers many benefits and has been used successfully by gardeners for decades.

Can an automatic timer be used on a hose system? Yes, it can. An inexpensive timer placed between the hose and the faucet can definitely turn the water off in a timely manner. This can be a huge benefit if one is forgetful. Because the end of the hose has to be moved from plant to plant, a timer in this system cannot easily be used to turn the water on automatically.

A more popular way to irrigate gardens and landscapes is to use some type of automated application system. The system can use drip emitters, sprinklers, soaker hoses, or bubblers, depending upon the soil type and the needs of the plant, to both turn the water on and off. In its simplest form, there usually will be 1) some type of tube running from the water source to the plant, 2) a device to let water escape at strategic places around the plant, 3) a sand screen to keep debris from clogging up tubes and emitters, 4) a back flow prevention device to keep water from being sucked back into the home water supply, and 5) a timer to turn the water flow on and off.

There are so many choices of delivery alternatives that it will take some study to figure out what is the best method for your particular system. Some people, for example, prefer soaker hoses to deliver water to trees or vegetable gardens because they are quick and easy to use. In other situations, punch-in drip emitters placed at specific intervals along the poly tubing are perfect for irrigating larger vegetable plants. Examples would be larger plants like tomatoes, eggplant, trees, and shrubs. They can also be used to irrigate smaller plants, but care must be taken to achieve good water coverage.

Another choice would be the use of inline drip irrigation tubing instead of soaker hoses or drippers. Inline drip tubing has the emitter embedded inside the poly tubing. Inline tubes are easy to install and easy to use. They are also self-cleaning, which can save a lot of time in situations where drip emitters regularly become plugged with sand or debris.

SELECTING AN IRRIGATION SYSTEM . . . CONTINUED FROM PAGE 7

Another variation is a hybrid flood irrigation system that combines the salt leaching capacity of a hose with the benefits of a timer. The system looks like any regular drip irrigation setup but instead of punch-in emitters there are bubblers which deliver water at a high flow rate. This type of system can be used with a timer because the tubing leads to bubblers located at each plant to be irrigated.

Sprinklers are sometimes used as part of an automatic irrigation system. Generally, we are not talking about the broad area sprinklers used in lawns. In garden and landscape situations, most people will select micro sprinklers which irrigate a much smaller area. These sprinklers can be selected for the amount of area needing to be irrigated. The problem with sprinklers in our part of the world is the high evaporation rate during our hot summers. Micro sprinklers are generally most effective at higher elevations where the summer high temperatures are not so extreme.

Any automated system will take a lot of the hassle out of the task of irrigating plants, as long as they are working correctly. To keep them working properly, they will need to be on a regular maintenance schedule. The type of maintenance performed will vary with the specific system and the owner's manual for each of the key parts. For example, the manual that comes with the timer will be very important to help learn the type of maintenance required for that product. It will also describe how to set the timer for the frequency and duration needed to properly irrigate the plants on the irrigation line. A lot of grief can be avoided if we will just read and follow the manual.

No matter what type of irrigation system is used, it is important to remember that the area receiving water, no matter whether it is a flood irrigation or an automated irrigation system, must fill the entire root zone of the plant. For trees and shrubs, the water needs run long enough to reach out to at least the drip line of the plant and to move down into the soil deep enough to reach the lowest roots.

The drip line of any plant is defined as the imaginary line that runs perpendicular to the soil surface and just touches the outside edge of the foliage. Most of the roots that pick up water will be that far out from the trunk of the plant, or even farther. The depth of the plant's root zone will vary with the size of the plant but generally we say that the roots of trees will go down into the soil to a depth of about three feet. The depth of the root zone for shrubs will be about two feet, and for bedding plants and small garden plants, about one foot. The only way to know for sure how deep the water is going is to either dig a hole with a shovel or use a soil probe. Many tree failures can be traced to shallow irrigations that do not reach the bottom layer of roots.

If you are into gardening, and want to take a load of stress off of yourself and your plants, a good irrigation system, along with a well thought out plan to use it, are indispensable for growing healthy 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 <u>macmastergardener@gmail.com</u> and a Master Gardener will contact you.

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

Richard Subson

Richard D. Gibson Extension Agent, Agriculture

RDG/te/sh/aw

59 mailed copies

