THE UNIVERSITY OF ARIZONA
Cooperative Extension

APRIL 2020 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**

CONIFERS IN THE DESERT

Pine, juniper, and cypress trees and shrubs are valuable additions to desert landscapes but, since they are highly different from the flowering plants, they require levels of care different from most other trees and shrubs.

Why are these plants different? One reason is that pines, junipers, and cypress all produce their seeds in cones instead of in flowers. This fact places them as near relations in a group that is collectively known as conifers, or plants that produce cones. Most people are familiar with pine cones. Junipers and cypress have them too, although they may be much smaller.

It is in these cones that the seeds for the next generation are produced. In flowering plants, the seeds are often protected by a fleshy structure that gives support to the young seeds as they grow. Just think of apple seeds in an apple core, the pit of a peach inside a juicy fruit, or the nut of a pecan growing inside a protective husk and you will recognize instantly how flowering plants protect their seeds differently than the conifers.

In conifers, it is somewhat the same, but different nonetheless. The cones of conifers are rarely juicy and never soft. The cones do protect the seeds, but inside the cones, and unlike an apple, the seeds are relatively loose and not overly attached to the cone. When the seeds are mature, and conditions are right, the cones will pop open to leave gaps in the cones. The seeds then simply fall out onto the ground. Have you ever seen the seed fall out of an apricot fruit? You are correct, it does not, and that is the one of the key features that distinguishes an apple from a pine cone.

Cone-bearing plants are different from flowering plants in other key ways. Cone-bearing plants tend to grow and develop much slower than flowering plants. It is just their nature to be slow and there is not much we can do to hurry them up. Oh, I guess we could water them more, but even that doesn't seem to make them grow too much faster than normal. If you are starting from bare ground and you need a fast growing landscape, pine trees or juniper hedges may not be the best choice.

Conifers are also different in the way that they are built. If you have ever somehow come in contact with pine gum, the sticky resin that gets on our hands, clothing, and sometimes in our hair when we are camping in pine forested areas, or when we are pruning on a conifer, you will easily recognize the first of these differences. Only the conifers have this type of protection flowing through their roots, trunks, branches, and leaves.

CONIFERS IN THE DESERT... CONTINUED ON PAGE 2

IN THIS ISSUE:

CONIFERS IN THE DESERT ... CONTINUED FROM PAGE 1

I say protection because that is one of the purposes of pine gum, sap, or resin, which ever term you prefer to use. The resin is found within specific structures, called resin canals. When these canals are broken for some reason, the resin tends to flow out. If it is an insect chews its way through one of the canals, the resin flows out and fills the chamber where the insect is feeding. It tends to cover the insect, clogs up its breathing apparatus, and kills the insect. Instantly the feeding stops.

Another way these plants are different is in its foliage. Instead of broad leaves, the pines have either needles for leaves or jointed segments called scales that fit together to form various shapes of leaves. In many cases, these leaves help the plant get by with less water and nutrients.

Among the pine trees that do well in the desert, we often see the Aleppo, Afghan, Canary Island, and the Italian Stone pines planted in our desert areas. Each has its own characteristics that affect how it looks, how it grows, and how well it does under our desert conditions.

The junipers have also become quite popular in our area. Varieties of various species of the Chinese and Bar Harbor junipers can be used as groundcovers, meaning that they grow close to the ground and do not grow up into a shrub. Varieties of the pfitzer juniper will become medium-sized shrubs, and some turn into column-type small trees. Unfortunately, the full-sized juniper trees are not well adapted to our high temperatures and low humidity climate. For this reason, we do not plant them here.

Let's turn our attention to the cypress trees. There aren't many but the two that are most common, the Arizona cypress and the Italian cypress, do very well here.

The Arizona cypress is native to our state. Because it is a native, we would expect it to do well, and it does. It has a cherry-red bark which many people find attractive. The Italian cypress is the tall, slender, grey-colored tree that grows up straight and narrow that we see planted around. It looks sort of like a telephone pole with leaves. Both species are often planted at the corners of buildings to help hide the stark angle of the corner. They are low water use plants, which many people find attractive.

The last common conifer planted in area landscapes is the arborvitae. It is a conical-shaped evergreen shrub that covers the trunk so that you never see it, unless it is badly pruned and cut back to the trunk. They are light to dark green in color and are very hardy in our climate. It is in the same plant family as the cypress trees and has a similar appearance to them.

All conifers in the desert need extra water. Many of them can get by with relatively little water to get by one but they do need an occasional irrigation in the summertime especially. Of all the conifers, the pine trees need the most water and should be irrigated throughout their root zone regularly through the hot months

The conifers are important components to our desert landscapes but proper care is essential if we hope to keep them healthy and looking good. By understanding how they are similar to other plants, and how they are different, we can help them successfully do the jobs that they were intended to do when they were first planted.

Fibrous Root Systems vs. Tap Root Systems

In order to properly care for our garden and landscape plants, it is important to know whether they have a taproot system, a fibrous root system, or a combination of the two.

Because the roots of plants are mostly underground, we often do not give them the attention that they need. Sometimes we do not think about them at all, and that can be a big mistake. For example, we often do not know how deep into the soil they grow or how far they extend out from the trunk of the tree or shrub. This information is critical when it comes to making decisions about irrigation and fertilization. How they grow, and where they grow, is generally determined by the type of root system they have. Let's take a closer look at the difference between taproot and fibrous root systems.

A taproot is a large, sometimes fleshy root that tends to grow straight down into the soil. From this taproot will grow side roots that will also help brace the plant. When the seed germinates and pushes its first root deep into the ground to quickly find water and nutrients, that first root in many plants continues to grow deeper and deeper into the soil to become the taproot.

Sometimes the taproots of plants can go quite deep, while others are relatively shallow. The taproot of our native mesquite tree, the honey mesquite, can grow deep into the soil seeking water. The taproot of the edible carrot, on the other hand, can be quite short. In both cases, long or short, the taproot is a critical storage organ for water and food supplies.

For plants that produce taproots, and are planted from seed, the taproot generally is in place for the life of the plant. Unless damaged, the taproot then can provide stability during a windstorm, and extra water and nutrients during times of drought or mistreatment. It is possible that because of a lack of water, compacted soil, or stony ground, the taproot may be limited, or even killed. Sometimes this creates a serious problem for the plant when the winds blow or drought comes.

Unfortunately, for trees and shrubs that are transplanted, the taproot will probably be missing. When these plants are grown in the nursery, they are planted from seed and the taproot is generally in place. When they are dug from the nursery soil and placed into a box or other container, the taproot is cut off and it never grows back. For these plants, there must be good growth of secondary roots in order for them to survive in their new location. If the root system never really develops appropriately, the tree or shrub can end up short of water and nutrients. Larger plants, like trees, may blow over in a windstorm.

Fibrous root systems, on the other hand, are made up of roots that originate off of the stem of the plant, just under the surface of the soil, and tend to branch frequently into multiple smaller roots. These smaller roots are well-adapted to growing into fresh soil to mine water and nutrients.

The size and shape of root systems are dependent upon the type of root system that each plant has, and the effects of the soil around the plant. Those plants with a taproot tend to grow deeper into the soil while those with a fibrous root system tend to stay more shallow. Some plants have both a taproot and a fibrous root system that give them both deep and far reaching root systems. When we remember that it is important to water all of the roots, each time that we irrigate, it becomes easy to understand why we need to be able to tell which kind of root system our plants have.

Since we cannot see the roots growing underneath the surface of the soil, we need to take our clues from the plant itself. The first round of decisions is not too complicated. Does the plant have leaves where the veins run parallel to each other, or are the veins in the leaf netlike? Long term readers will remember the recent discussion that we had about the difference between monocot plants, those with parallel veins, and dicots, those with veins that go in all different directions. Here is another reason to be able to tell the difference between a monocot and a dicot plant. Monocotyledon plants, those with one storage leaf in the seed, tend to have fibrous root systems only. Palm trees

- **Fibrous Root Systems vs. Tap Root System . . .** Continued on Page 4

FIBROUS ROOT SYSTEMS VS. TAP ROOT SYSTEMS . . . CONTINUED FROM PG.3

and grassy plants do not have taproots. Dicotyledon plants, those with two storage leaves in the seed, do have taproots. Some mature dicots can develop both a taproot and a fibrous root system.

In general, then, most trees and shrubs with fibrous root systems only, like the palms and the grasses, will have root systems that will stay relatively close to the surface of the soil, say within three to four feet, but will have many roots that tend to help it stay anchored firmly into the soil. Lawn grasses may go as deep but most stay within the top eighteen inches of the soil surface.

Plants with taproots will have root systems of varying sizes. Turnips, radishes, and other vegetables with an edible taproot may grow only a few inches into the soil. Desert-adapted plants may have deep ranging taproots that grow many feet into the soil. Most of the latter also have a fibrous root system that stays relatively shallow but ranges far and wide. Mesquite, palo verde, and ironwood are excellent examples. Citrus can develop a taproot but since most trees that we buy are dug and placed into a container, they rarely have a taproot. They must rely on secondary brace roots and a strong, well-developed fibrous root system.

Still, there are other considerations, of course. Soil conditions or the presence of caliche can influence the shape of roots. If a plant stays in the container too long, the shape of the root system will always maintain the shape of the container in which it became root bound.

I have examples in my collection of plant horrors of all types of plants, including palm, mesquite, palo verde, and citrus trees that show misshapen root systems because they stayed in the container too long. It doesn't really matter whether they have taproots or not. The roots of plants with this problem never really extend out of that original size and this can impact the size and depth of the root system. You can usually tell if this is a problem by looking at how the plant grows. If it is small for the time it has been in the ground, and weakly looking, root binding may be a problem.

"So," you ask, "how does all of this tell me where should I place my irrigation water?" That is a great question. Because we rarely can irrigate every spot where a root might be growing, we simply say that we should irrigate, and fertilizer, out to the edge of the tree canopy. We should let the water run as long as it takes for the water to reach a depth of tree feet for trees, two feet for shrubs, and one foot for bedding plants and lawns. It is not always as precise as we would want it to be, but as a rule of thumb, it gets us by.

It is important to remember that the root systems of different plants, even within the same species, can be uniquely different one from another. If we understand the basics of taproot versus fibrous root systems, and then remember that the root system of one plant may be hugely different than another next to it, we can make good decisions when it comes to providing good care for our plants.

Eliminating Weedy Fire Hazards

Along with a bumper crop of wildflowers, the rains this year have spawned large quantities of weeds which, now that they are drying up, have created a significant fire hazard throughout the county.

The soil everywhere serves as a tremendous reservoir of seeds of all kinds and with just a little bit of water, these seeds germinate and begin to grow. When there is sufficient rainfall, such as this past winter, they can become quite large and plentiful.

Throughout the southern part of the state, huge plants are growing alongside roads, alleys, in vacant lots and in short, just about every disturbed and undeveloped area. Once the plants have finished producing their seeds, they die. Their dried remains are the fuel that makes all of these areas a fire hazard. We need right now to begin taking steps to protect ourselves from fire danger.

You are probably saying to yourself that there are so many green weedy plants everywhere that the task is well nigh impossible. If most people ignore the problem, you would be correct. However, the job is not too big to do if we all work together. Here are some steps to take.

First, take a survey of your property. Check the alley behind your home. Look behind outbuildings, along fence lines and in hidden service areas. Weeds will grow in many places where we normally do not look. When growing in locations next to buildings or other flammable structures, they can become a fire hazard without us even knowing.

Next, try to decide the type of weed with which you are dealing. Do not worry too much about plant names. Instead, focus on their growth habits. Are they tall and rangy? If so they will probably burn easily when dry. Focus on these first. Do they have a deep taproot, or are they shallow rooted. This information will determine the best way to control the weeds, and in some cases the tool that you will use.

Plants that are still alive and have a deep tap root often will regrow from buds in the crown, the place on the stem located close to the ground. If possible, cut these off just below the crown to reduce the chance of regrowth. Plants with shallower root systems can usually be easily removed.

Now, let's take a look at control measures. Forget about using weed killers. Most of the herbicides sold for home use are not strong enough to kill these large, tough weeds. Herbicides are best used when the weeds are small, just after emerging from the soil. Our best bet at this time is to use some type of tool to cut them off at the base.

The fastest and easiest way to make quick headway against a large weed population is the standard lawn mower. Heavy duty and rugged, a lawn mower can easily cut through most weeds. If it is equipped with a catch basket, it can save a step in the clean up process by taking away the need to rake up the weeds after cutting. The power mower is excellent for a quick alley cleanup, but it is important to make sure that all rocks are removed before mowing. Flying rocks can damage the mower blade and severely injure bystanders, including pets and curious children. There is a chance that weeds could regrow from the crowns of mown weeds, but it is easy enough to run over them again with the mower if this occurs.

Another tool useful for quick cleanup is the string trimmer. String trimmers, which are normally used to edge lawns, are good for alleys, open spaces and larger confined areas where a mower may not fit. A low horsepower, thin-lined model will work good for small weeds, but once the weeds mature, a larger machine with heavy line will be needed to cut through their tough stems. Because the whirling string can kick up small rocks and sand, it is important to wear eye protection. Beware of bystanders.

When using string trimmers to cut grass and weeds around the trunks of trees and shrubs, remember that the string can easily damage the tender bark of many plants. Girdling a trunk or stem can cause enough damage to kill the plant.

Eliminating Weedy Fire Hazards . . . Continued on page 6

Eliminating Weedy Fire Hazards - continued from page 5

Always place a shield around the trunks of these plants before approaching with the string trimmer.

In tight, hard to reach spots, it may be necessary to use a standard garden hoe or one of its relatives. The narrow-bladed chopping hoe is a good alternative. While the larger hoe works well in wide open spaces, the narrow hoe is much easier to use where plants are close together or spaces are tight. The narrow hoe will have a blade anywhere from one to two inches in width.

The push-pull hoe is a tool that does its work, not with a chopping motion, but with a back and forth motion as it is pulled and pushed through the soil. The push-pull hoe slices through weed roots just below the surface of the soil and generally requires less force to operate than the standard chopping hoe. They are good for cutting tap roots below the crown.

Another popular tool for cutting tough, rangy weeds is the weed hook. This tool is a flat blade attached to a handle and operated by swinging the blade back and forth. If handled correctly, it can easily slice weeds off close to the surface of the soil. It is quite effective for clearing large patches of weeds in wide open spaces. The blade must be kept sharp with a file in order to work at peak performance.

When using a weed hook, it is important to make sure that the work area is kept clear of pets and people. The swinging motion of the hook can cause serious injury to those unaware of the danger. A new operator may find that it is difficult to keep the blade out of the dirt and away from rocks as it is swung back and forth. Practice will soon provide experience to correctly judge the correct height to swing the blade.

In gardens and lawns, places where weeds also love to grow, it may be worth while to actually pull the weeds out by the roots. Such intensive efforts can leave a better looking area than if they are just mowed or cut. For close work around desirable plants, consider using a linoleum knife and gloves. A knife blade is much easier to control around these plants than a hoe or trimmer.

You may be wondering about the native desert areas where you and I have no control. Much of the vacant area in the county is classified as rangeland. You may have noticed, while out searching for wildflower displays, that there is a lot of cattle feeding in these areas where in past years there have been very few. These animals harvest the increased forage as food and turn it into a sellable product: beef.

Bands of sheep have also been grazing desert pastures and along rural roads where normally they are confined in irrigated pastures. Feeding by range animals is an excellent way to remove biomass before it becomes a fire hazard and at the same time turn it into a valuable resource.

Finally, what should we do with the plants after they are cut? If they have not gone to seed, I like to use mine as a mulch around my trees. Shredded pieces are better than whole stems, but both work okay. The plant residues slowly break down over time to release nutrients into the soil and to help cut down on water evaporation from the soil.

Composting is also another possibility. Plant trimmings make excellent, rich compost if correctly handled. If you, yourself, are not into composting, there are those who would love to incorporate your weeds into their composting programs.

While the rains bring us much needed water to fill our parched reservoirs, bring out a bumper crop of wildflowers and brighten our spirits, we also have to deal with the downside appearing in the form of weedy plants. By working together we can minimize the ultimate danger to our homes and our neighborhoods.

Using Fungicides Correctly

While most people know about insecticides and weed killers, the fungicides are sometimes a mystery.

When it comes right down to it, there are plenty of insect and weed problems against which we continually fight. Because of this, we tend to have more experience with the insecticides and herbicides. Still, there are actually quite a few potential plant disease pathogens that we need to keep in mind. Fortunately, compared to more humid regions, the number of diseases that need to be on our gardening radar are relatively few. For that reason, we may not have had a need to study the fungicides in detail.

The reason that there are relatively few plant diseases to worry about in Arizona is, well, because we live in Arizona. Fungi generally do best in humid and warm conditions. While we have the warm, we generally do not have the humid, at least for any great length of time. Because of this, we do not see as many diseases that they do in, say, the southeast part of our country. That is definitely good news for us.

Still, we do have our share. Powdery mildew causes problems on grapes, roses, and other garden and landscape plants. We cannot forget the root rot fungi, such as Pythium, Phytopthora foot rot of citrus, and the dreaded cotton root rot disease. Many lawn diseases are caused by fungi. Heart rot of trees, sooty canker, rust on leaves, water conducting tubes clogged up by Verticillium, and many other diseases must also be considered.

How do we solve these kinds of problems when they arise? Well, quite frankly, the solutions are as varied as the diseases. Proper pruning, irrigation, fertilization, and protecting the bark from injury are key ways to protect plants from disease. Sometimes the proper use of fungicides, chemicals that kill fungi, is often part of the solution. When it comes time to select and use a fungicide, no matter whether the chemical is all natural or not, we need to know how they work and when and how to use them.

Let's start with the basics. What is a fungus? Most of us are familiar with the edible mushrooms that we find in our soup, salads, or other entrees that we eat at home or at restaurants. We are also familiar with the poisonous mushrooms that we sometimes find growing in our yards after a rain. There are many other types of fungi. They range in size from those that have only one cell to the large, highly visible puffballs, conks, molds, and mildews.

Fungi make up an entire kingdom in the world of biology, just like the plant and animal kingdoms. What places a living thing into the kingdom of fungi is the presence of a chemical called chitin. It is a somewhat complex molecule and is closely related to sugar from which it is constructed. It gives form and protection to any animal or fungus in which it is found. For example, it is the reason many insects "crunch" when stepped on. It is this same chitin molecule that gives strength to a fungus and allows it to stand up erect.

Not all fungi are bad fungi. Some are quite beneficial. You already know about the edible fungi. Many kinds of fungi help break down dead plant and animal tissues and return the various parts to the soil where they can become once again a plant nutrient. The mycorrhizal fungi help plants find water and nutrients. Other types of fungi provide additional benefits as well.

Some fungi are neither good or bad. They are just there, like puffballs. They have their place in the environment and we tend to just leave them alone. From a gardener's perspective, however, the ones we do have to guard against are the plant pathogenic fungi, or those that cause a plant disease. How do we guard against them? That is where the fungicides come in.

There are a number of products for sale on local nursery shelves that can help control fungal diseases. I know, when you walk in to find a product and see the array, it can be just a little intimidating. If you are new to this class of pesticide, it may be helpful to find a knowledgeable attendant and ask for help, but here are some of the basics that you will need to know.

Using Fungicides Correctly . . . Continued on Page 8

USING FUNGICIDES CORRECTLY . . . CONTINUED FROM PAGE 7

First, all pesticides will have a trade name, a common name, and a chemical name somewhere on the label. The trade name is usually in large letters on the front of the container. The common name and the chemical name will be in the active ingredient list. The common name will usually be the one that is easiest to read.

I like to use common names because I can compare products containing the same active ingredient. I do this for price mainly, but also to find out how to apply the chemical. Some products are easier than others to handle and apply. Where do I find all of this good information. It is always on the pesticide label. The label will provide much, if not all, of the essential information that you will need.

Second, fungicides can be grouped basically into two groups. The first group contains the natural fungicides, many of which can be used in organic production systems. Into this group will go the oils and the soaps. Common examples are extracts of neem, peppermint, rosemary, and clove oils. Also included in this group would go the fungicidal soaps, copper soap being one of the most common. You may be familiar with the sulfur sprays and dusts that have been used for decades. They are part of this group. Don't use sulfur after the weather warms up, however. It can damage plant leaves.

The second group includes those that include chemistry that has been found effective against fungi. Some are relatively specific for one or just a few diseases. Others are quite broad spectrum and designed to be used against a variety of fungal diseases. Common examples on store shelves of fungicides in this group include chlorothalonil, captan, mycebutanil, propicconazole, and its cousin, tebuconazole. There are others, of course, but these seem to be the most common.

Finally, the list of diseases against which all of these various fungicides work will be found on the label. It will also tell how and when to apply them. For best results, it is important to apply fungicides in the right way and at the right time. Remember, the label is your best friend. Check it out.

There is another key fact that must be stressed and underscored! Rarely can fungicides solve an existing disease problem. They are most effective, especially those from the all natural group, when they are applied before the onset of disease. Once fungi get into the plant and start doing their thing, it is very hard, almost impossible, to get them out. In addition, it is rare that we can reverse any damage to the infected plant. For this reason, it is important to become familiar with the diseases, know when they begin to show up, and then apply the protectants before the fungi get inside your plants.

By knowing when and how to use a fungicide correctly, it is possible to prevent plant diseases from causing problems in the garden.

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. Our office doors are closed, but we at the Pinal County Extension Office are practicing social distancing by working remotely, and are able to monitor the emails and the phones. Please be safe.

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

Richard D. Gibson

Extension Agent, Agriculture

RDG/te/aw

57 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