



Pinal County Cooperative Extension Garden & Landscape Newsletter April 2008



PREPARE FOR HOT WEATHER

As we move into the month of May, we can expect hot days and cool days alternating towards the high heat of June. Now is a good time to review steps to protect our garden and landscape plants from the heat of summer.

First, always provide sufficient water to meet the particular demands of the plant. Chilean mesquite trees, for example, will generally need less water than a bed of Vinca. Cacti need only an occasional irrigation, while a mulberry tree will need to be watered every three or four days during the hot season. Always know, and provide the relative amount of water needed by specific plants.

Second, be sure to place the water exactly where it is needed. Providing water only near the trunk of a large tree will not do the tree any good. Most of the feeder roots that collect water and nutrients are out at the extreme edges, or the "dripline" of the tree. For irrigation water to provide maximum benefit, it needs to be placed where the plant can make best use of the moisture.

Third, understand that water is critical for cooling plants. Most water absorbed by plant roots is used for transpiration, the loss of water vapor through the leaves. At the end of its trip through the plant, water enters open spaces between the cells of the leaves where it evaporates and exits the plant through tiny holes in the leaf called stomata. This movement of water vapor out of the plant acts much like an evaporative cooler by removing excess heat and leaving the leaf tissue cool to the touch. Supplying enough water to keep the transpiration process going is a critical step in protecting landscape plants in the desert. Insufficient water at any time during the growing season can seriously damage plants.

Fourth, schedule irrigations carefully. Even though a particular plant may need a certain amount of water through the summer months, just about all plants will require their roots to be exposed to air at

least some of the time. Water-logged, always-wet soils often lead to water mold root rot problems that can also seriously damage plants. When scheduling irrigations, be sure to allow the soil to dry somewhat so that air can return to the soil and give roots a chance to breathe.

Fifth, check all equipment on a regular basis. If you have a sprinkler or drip irrigation system, it is important to check each part every so often, to make sure it is functioning properly. Check for clogged or misdirected sprinkler heads. Are drip emitters working correctly or do they need to be removed and cleaned? Sometimes plastic tubing or PVC pipe will develop leaks or sustain damage from animals or soil tillage. All repairs should be made as promptly as possible to avoid water stress to plants and to save money.

Sixth, control salts in the soil. All soils and waters in Arizona contain at least some dissolved salts with some being more salty than others. In the Casa Grande Valley, most water supplies are fairly good, but if care is not taken, salt can build up within the root zones of all plants no matter where they are located and cause major damage, depending upon the susceptibility of the plant and the overall concentration of salts.

Control salts by adding enough water to the soil to move the lower edge of the wetted pattern deep enough to reach beyond the lower roots. If you

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ELIMINATING WEEDS BEFORE THEY BECOME A FIRE HAZARD

It is time to pull out the chopping hoe, lawn mower or string trimmer and get rid of the weeds in our yards and alleys.

As the weather turns warm, the wild grasses and weeds of winter begin to dry and turn brown. They are ugly. They make our landscapes look unkept and messy. They can harbor mice, outdoor roaches and other pests. Perhaps most important of all, they can also create a significant fire hazard around our homes and yards. Now is a good time to cut them down and dispose of them before they become a problem.

It happens every wet season. If we get any rain at all, weedy plants appear like magic, growing and flourishing until they finish their life cycle. Then, because most of them only live for one growing season, they die out and turn brown. If we do not stay on top of them, these weedy plants can quickly become a major headache.

The soil everywhere, you see, is a tremendous reservoir of seeds of all kinds. Capable of lying dormant for years until conditions are just right, they are stimulated by sufficient moisture to germinate and grow. Left unchecked, ignored if you will, these unwanted plants can create a huge problem. However, if we all work together, we can greatly increase the safety and attractiveness of our communities.

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 with 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 well 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

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tender bark of many plants. Girdling a trunk or stem can cause enough damage to kill the plant. 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 worthwhile 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? 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, they also bring us weedy plants. By working together to eliminate weeds we can minimize the ultimate danger to, and increase the attractiveness of, our homes and neighborhoods.

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.

WHEN SOILS REFUSE TO ACCEPT WATER

When our desert soils refuse to take water, and plants begin to wither and die, we have a problem that has to be fixed, and fixed soon. Before we can talk solutions, however, we need to talk first about the characteristics that make our soils unique.

All soils are made up of small rock particles of various sizes that have broken off from larger rocks. These small particles still contain many of the physical and chemical characteristics of the larger formations from which they have been eroded, but their relatively small size gives them additional attributes that make it possible for them to support plant life. These small particles, together, are called soil.

Soil particles come in three different sizes and we give them names according to their size. Sand particles are the largest, clay particles the smallest and silt particles are in between. If a soil has a majority of particles that fall within the dimensions for sand, we call it a sandy soil. If it has a majority of clay particles, it is a clay soil, and if it has a majority of silt-sized particles, it is a silty soil. A fairly uniform mixture of two or more of the three categories makes it a loam soil.

Besides the small particles, soil is also made up of decomposed organic matter, water and air. These fill the empty spaces between the soil particles. Water, a liquid, and air, a gas, can move quite easily in and through these gaps as long as the physical and chemical conditions of the soil are correct. Organic matter, properly applied, will also aid in water and air movement. If soil conditions are out of balance, however, problems can arise.

An important physical condition of the soil is the soil structure. Simply put, soil structure is a measure of how well the soil particles are arranged in the soil. Soil particles are usually not uniformly smooth on their edges. Rather, they usually have bumps and ridges, indentations and hollows that, as they lodge against one another, leave gaps that allow water and air to move into, and through the soil profile. The gaps between the particles have a name; we call them pores and collectively, pore space.

Soil pores are quite fragile. They are, after all, just empty space. Anything that clogs the pores, or which causes them to collapse in on themselves will reduce their ability to conduct water and air. This movement of water and air is critical to the growth and development of plants rooted in the soil. Good movement usually means good health; poor movement usually means poor health. Therefore, it is critical to protect these pores if we want healthy plants.

So, what causes these pores to collapse or become clogged? There are any number of reasons. Mechanical packing due to foot or vehicle traffic is one of the more common. The weight of people or cars pressing down on the surface of the soil can cause the soil particles to collapse in on themselves and narrow or completely eliminate the pores in the areas of heavy traffic. That is why it is important not to walk on a flower or garden bed after the soil has been tilled. Likewise, we are all familiar with the compacted, bare soil underneath children's playground equipment or in an unpaved vehicle lane. Clay and silt soils are more susceptible to compaction than sandy soils. If you are having water penetration problems, check your soil structure first.

Another physical cause for slow water penetration comes from the nature of clay particles themselves. Because they are so small, it is easy to pack a larger number of particles into a given space. Yes, compaction can be part of the problem, but there is more to it. Because of their small size, and because there are more particles in a given space, there is more pore space through which water and air can travel, and, there are more particles into which water can bump. Trust me on this. Clays just naturally take more time to accept water. If too much water is placed onto the soil in too short a time, a clay soil can easily become waterlogged. With a clay soil, check your soil moisture level before you irrigate.

Sometimes the soil does not readily accept water because of a chemical problem with the soil. Caliche, a deposit of calcium carbonate or lime, or an overabundance of sodium are

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MID-SEASON TASKS FOR SPRING GARDENS

Now that we have reached the midpoint of our spring garden season, we cannot rest on our laurels. If we want to finish the season with a flourish, and not let our gardens descend into spring blah chaos, we need to be out there tending the plants.

Flower gardens everywhere are bursting with color and vegetables are on their way to harvest. I haven't seen the first tomato of the season yet, but I know that someone, somewhere, has pulled that first one off the vine and taken a juicy bite. The rest of us, however, if we were not scared off by the frosty weather just a few short weeks ago, are well behind.

Spring sweet corn should be at least knee high and other summer vegetables, like eggplant, melons and broccoli should be well along in their development. Lettuce, radishes and turnips are just about at the end of their season. The warm weather just around the corner will soon see to that.

Fruit trees everywhere are laden with fruit. Apricots and peaches are about half-way to harvest. I have seen some heavy loads on trees in spite of the cold weather this year, and it looks like most citrus trees have survived the cold snap with a minimum of damage. Yes, some trees took a beating, but it could have been much worse. In general, most of the damage was sustained by younger trees.

Okay, so what do we need to be doing in the garden? The first job is to ensure that your garden areas are still receiving plenty of sunlight. Most flowers and vegetables require full sunlight. If they do not get sufficient light, they will not be successful. The only exception is tomatoes. When the weather consistently edges over the 90 degree F. mark, you may want to put a sunshade over your tomatoes to avoid sunscald, but it is still early, in my opinion, for that. If the garden is overshadowed by trees or if your potted plants are under the overhang, consider lightly nipping back some of the offending branches or moving your containers a little closer to the light.

It is important mid-season to check your soil drainage. Drainage problems can occur from a chemical accumulation in the soil, such as sodium; when the soil texture, generally too much clay,

prevents good water penetration; or when we consistently over water and the soil becomes saturated. In each case, the plants often will be stunted and unthrifty. In extreme cases, they will collapse and die. When drainage problems occur, corrective action is necessary; so dig down in your garden soil with a shovel or garden trowel and check the moisture level. If the soil consistently stays sloppy wet, make some changes.

Garden success is largely determined by the varieties we select. I recommend that you always choose varieties from those known to do well in this area. However, I would also encourage you to try one or two new varieties each year. This will not only provide an interesting change from year to year, but also search for that new type that performs just right for specific local needs. Plant them next to your old favorites for comparison. As you decide whether they give you good service or not, it is a good idea to keep notes in a written diary. It will help you remember for next year.

It is time to check your organic levels in the soil. Organic matter makes the soil loose and easy to work and improves water-holding capacity, drainage and aeration. Manure, compost, peat moss and leaf mulch are materials commonly used. Composted manure is easy to use and is relatively free of weed seeds. I like to add a mid-season application to the surface of my soil to help prevent water evaporation and to keep the soil from crusting. It is easy to work it into the soil as I gently till around my plants.

Now is a good time to fertilize. Growing plants use nutrients from the soil continually to sustain growth. Here at mid season it is a good idea to add nutrients regularly so that the plants are not limited in their development. A fertilizer containing both nitrogen and phosphorus is good, but it needs to be lightly tilled into the soil or the phosphorus portion will be lost. If you fertilize regularly, it will not take much to get the job done. Ammonium sulfate, 21-0-0, can be watered into the soil without incorporation. Organic fertilizers, like blood meal or compost can also be used.

It is also a good idea to check your irrigation systems. Leaks, plugs and filter problems can greatly diminish the amount of water going to the plants. A lack of water during this part of the season and as the temperatures warm can be

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suspect that sodium may be a problem, an application of gypsum may be in order. With a drip system, irrigations may have to occur more frequently, perhaps every other day or so depending upon the type of emitters used, but water applied to the soil should still be deep and wide enough to leach extra salt from the root zone of plants.

Finally, check the soil moisture level frequently until you know the pattern for wetting and drying during the course of the irrigation cycle. Different soils require different amounts of water and one soil that can absorb large amounts of water, like sandy soils, may not hold true for other soils like clays that cannot absorb water quickly. Testing the soil is one way to know exactly what the moisture level is and to make good decisions about when and for how long to irrigate.

The best way to determine irrigation frequency, which is influenced by the temperature, type of soil and the evaporation rate of water from the soil surface, is to dig down about six inches into the ground and pick up a handful of soil. If the soil remains in a hard ball after it has been squeezed, it probably is still moist enough to support plant growth. If, however, the ball begins to crumble when the hand is opened or if the soil is starting to feel dry, it is time to water.

With this one quick and simple test, anyone can properly determine the correct irrigation frequency for the specific conditions in their own yard. Don't forget that the irrigation frequency that supports proper plant growth in the winter and spring will probably not be sufficient in the summer when temperatures go up dramatically.

The importance of maintaining good soil moisture in the root systems of all plants cannot be overstated. Throughout the county, there are far too many incidences of needless heat-injury to garden and landscape plants. It is needless because the severe injury of high temperatures could be avoided by following good plant care practices.

Hot weather can indeed be devastating to water-stressed plants, and, if we are not careful, plants can get stressed for water quickly in the dry heat of Arizona. With careful planning and by paying close attention to the conditions of our outdoor plants, summer damage can be held to a minimum.

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fatal. Do not let your irrigation system fail you at this critical time. If you are using a hose, calendar your next irrigation time so that you do not forget.

Okay, here is the one you have been dreading. Watch for weeds. The soil abounds with the seeds of many plants. These seeds have accumulated over the years lying dormant in wait for just the right conditions for germination and growth. A vegetable garden provides those conditions. Removal of weeds will enhance the growth of desirable plants. Even small weeds can slow down the progress of new seedling vegetables, so pull them early. The brilliant colors of flower beds can be greatly diminished if we do not keep the weeds pulled.

While we are weeding, it is a good idea to watch for insect infestations. Spring gardens are often attacked by aphids, mealybugs and other insects. These populations can explode quickly so a careful watch is important. Early infestations of these insects can usually be controlled by spraying them with a strong stream of water from the hose. Beneficial insects, like lady beetles, lace wing larvae, and big-eyed bugs, will be attracted to these insects and will often clean up these pests if the population does not get out of hand.

Okay, the season is almost over! Your flowers are magnificent, your vegetable gardens are productive and life is easy. The spring garden season is at its best! If you are one of the lucky ones that can claim success like this, consider your fortune. If you are one whose gardens are not as successful as you would like, keep trying. Success will come as you apply correct, desert-adapted garden principles in your daily chores.

For more information on how to prepare for spring gardens, ask for a copy of the Cooperative Extension leaflet, "Ten Steps to A Successful Vegetable Garden".

notorious for slowing water and air movement through soils. Caliche can be physically removed by hand or machine if the deposit is of a limited size. Otherwise, a caliche problem can be solved by digging or drilling holes down through the layer to a more permeable soil layer. These holes then allow excess water to drain away from your plant's root zone. It is a good idea to backfill these holes with sand to help keep them from caving in and reconsolidating.

Sodium in the soil can cause the individual soil particles to separate from themselves chemically and then collapse into a condition that eliminates much of the pore space, seals off the entry points into the soil and tends to repel water. If sodium salt is a problem, water may stand for hours and sometime even days before it sinks in or evaporates away. If compaction or caliche can be ruled out as the culprit for water movement problems, then sodium may be a problem. Here is my sodium rule of thumb: if it takes water more than thirty minutes to sink in, treat for sodium.

How do we treat for sodium? Gypsum, available by the bag at most nurseries, is an ideal way to deal with sodium problems. Sprinkled on the surface of the ground and raked gently in before a deep irrigation, gypsum will replace the sodium in the soil with calcium. The deep irrigation then leaches the sodium out of the root zone.

Soil sulfur can also be used to eliminate sodium but it will only work if there is calcium or free lime already in the soil. Sulfur, wet with water, becomes sulfuric acid which combines with the calcium to form gypsum. The process then proceeds as described above.

The improper use of organic matter is another possible culprit for slow movement of water through soil. Some organic matter sources, like peat moss, fine grass clippings and manures high in undigested plant materials, especially when that manure has been trampled into a fine dust, are often water repellent. They do not absorb water easily and tend to float when immersed into water. Not until they are well saturated with water do they soften up and lose their tendency to repel water. In the soil, these water repellent organic sources,


until they become fully saturated, can actually slow the movement of water into the soil profile by clogging the pores and repelling the water. This really defeats the real reason for using them in the first place.

To avoid these kind of problems, it is a good idea to use well composted organic matter whenever you can. If you choose to use peat moss or a fine, uncomposted manure, it is a good idea to thoroughly soak them in a bucket, barrel or wheelbarrow before you add them to the soil. Soaking forces them to accept water into their structure and makes it easier for irrigation water to later move into and through the material. You may also need to start slowly with these materials. By starting slowly, I mean use only a small amount at each application and then plan to make multiple applications through the gardening season.

There are other reasons, of course, why soil will not accept water, but we have reviewed the more common culprits. If you sense that you may have a water penetration problem, try one of these solutions first.

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.

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