If you have seen fluffy, white patches on the surface of your prickly pear cactus, you will have seen the interesting and potentially damaging cottony cochineal scale.

The cottony cochineal scale insect can be a serious pest on all species of prickly pear and cholla cacti and their feeding, if the infestation is heavy, can seriously damage or kill their host plant. Fortunately, there are ways to keep this pest under control.

Prickly pear and cholla cacti make good desert landscape additions because of their low water use, their iron-tough nonchalance about desert conditions and their intriguing shapes and color. Many people love to plant them because they give an authentic desert feel to their home environment.

Unfortunately, all of these species of cacti can be attacked by the cochineal scale, an insect with a sucking mouthpart and a white, waxy coat that protects it from danger. However, a working knowledge of the animal’s biology can provide valuable clues to help get the upper hand.

The white, fluffy appearance of the waxy protective covering of the cochineal scale makes it look like a fungus growing on the surface of susceptible cacti but it is definitely an insect in the Order Homoptera. Related insects include the aphid, the mealybug and the white fly. They are characterized by their soft bodies, sucking mouthparts and their ability to reproduce quickly.

The cochineal scale feeds by inserting its feeding tube into the moist internal structures of the cacti and sucking out the juices. Feeding damage is fairly simple to recognize. The plants take on a wilted, shriveled appearance as the fluids are removed from the pads. One insect alone cannot cause these visual symptoms, but a heavy infestation, especially during times of drought, can cause serious damage, even death, to these cacti.

The males and females take on different forms. The males pass through their life changes early and emerge as delicate two-winged flying insects at a time when the females are about one-fourth to one-third mature. It is at this time that mating occurs, after which, the males disappear from the scene. As the males have nonfunctional, abortive mouthparts, they cannot feed and therefore can do no damage.
The female is red in color, oval in shape and distinctly segmented. The legs and antennae of the female are short. She produces many separate white, waxy plates that cover her entire body and provide her protection from the elements. It is this protective barrier that makes it difficult to control the insect. A regular application of insecticide, for example, will roll right off, just like water off of an umbrella.

The female scale attaches herself firmly to the feeding site, inserts her feeding apparatus into the flesh of the cactus and begins to suck the juices from the plant. From these fluids she will gain the strength to carry out her life functions. Once attached to her feeding site, she will never move again. The attachment is so tight and so permanent that the insect actually appears to be growing from the plant itself. The white, waxy covering and the firm attachment to the plant cause many to mistake the insect for a growth of fungus.

It is quite simple to make sure that the growth is actually the cochineal scale. With a knife blade, twig or other instrument, probe into the fluffy mass and look for the raspberry red fluids that make up the body juices of the insect. If the end of the probe comes away with this deep red color, it is the cochineal scale.

The vibrant red color of the body fluid is the source of a crimson dye produced by some of the native tribes of Mexico. For centuries, this dye was a coveted source of color among these people. The Spaniards, upon their arrival, sensed the value of the dye and transported the insect and the dye production into many parts of the world.

The dye material was collected by brushing the mature females from the cacti and drying them in the sun. The pigments were extracted from their dried bodies. These insects were commercially important until about 1875, when aniline dyes were introduced. Today, there are traditional weavers who still collect the insects and produce the dye for their own use.

Control of the cochineal scale is fairly straight forward and simple with the right procedures. The first line of defense can often be as simple as a strong, steady stream of water.

Use a pressure nozzle on the end of a hose to wash off the insects before they become attached to the host plant. Be careful that the water pressure does not injure the outside cuticle of the plant because any damage can leave the plant open to disease. It can also cause unsightly discoloration of the pads. Attached insects can be removed by brushing them with a stout-bristled brush. If the insect has become so tightly attached to the plant that they will not wash or brush off, an insecticide application may be necessary.

When using an insecticide, the secret to success is to add a wetting agent to the mixture before application. The wetting agent improves the action of the insecticide by spreading the spray droplet on the surface of the waxy covering, by helping the droplet penetrate through the covering down to the surface of the insect and by sticking and spreading the insecticide to the insect for maximum control.

Commercial wetting agents can be purchased at any pesticide retail center, but it is less expensive and easier to simply use a standard liquid dish detergent. One capful of the detergent in a gallon of spray mixture should do the trick.

The liquid insecticide malathion is probably the best material for cochineal scale control, but acephate and some of the new pyrethroids should also be effective. Before using any chemical, check the label for instructions.

The cottony cochineal scale is an interesting insect that looks much like a fungal growth on the pads of prickly pear and cholla cacti. Although damage is a possibility, good controls are available.
It is easy to put off, but sooner or later you just have to bite the bullet, pull out the pruning shears, and cut back that English ivy.

English ivy is well adapted to all of the harsh conditions of the low desert, except for our intense sunlight. In our area, English ivy prefers full shade, such as under an eave, or on the north side of a building. It grows well when conditions are correct and it can add a touch of grace to a bare wall or empty garden patch.

English, Algerian, and Persian ivy are three members of a family of plants characterized by aerial rootlets. These tiny appendages allow the plant to cling to, and climb, vertical surfaces. All three types of ivy make excellent groundcover for shady locations. I like the English version for its broad leaves and dark green color.

Ivy is an ideal groundcover because it shields the ground in a dense, green coat and uses only moderate amounts of water. I have not noticed any disease or insect problems. The combination of heavy shade and thick canopy tends to discourage the growth of all weeds, including even the super tough ones like nutsedge and Bermudagrass.

The many positives presented by ivy are offset by only a few minor negatives. Ivy leaves, especially those of English ivy, simply cannot tolerate the harsh, summer sun in this area. In the summer, as the sun advances northward, the part of our ivy bed which previously was covered by shade finds itself bathed in full sunlight. The exposed leaves quickly burn in the sun giving them a ragged and ugly appearance.

Another problem is caused by the thick, luxurious growth of the three- to six-inch wide ivy leaves. The large leaves and thick growth tends to shade out and kill the leaves and vines growing underneath the outer canopy. The dieback of the leaves and twigs does not really hurt the overall health of the plant, it just causes a tangled mess that sooner or later needs to be cleaned out.

Ivy is also quite invasive, meaning that it will often go places where we would sometimes prefer it not to go. One often desirable benefit of its aggressive behavior is the ability of the ivy to easily creep up walls and other vertical surfaces. The resulting green curtain gives a visually appealing effect. The flip side is also true. If we do not want it to grow up a wall, it can quickly become a continual battle to keep the vine in its place.

The vines are so aggressive that they can force their way underneath window screens and fill the space between the screen and window. Likewise, the vines are often found growing up between the bond beams and the walls into the crawl spaces and attics of homes. Because of this tendency, many people make it a priority, and a constant garden task, to keep the various vines pruned back.

An ivy bed that has not been thinned or cleaned regularly can become a litter of dead, dry leaves and brittle branches. The jungle can become a haven for spiders and sometimes scorpions who seem to like to hide in the dead leaves and branches. The dead plant remains can also become a fire hazard, and for this reason alone it is necessary to clean out the bed from time to time.

One characteristic of ivy is the brittleness of the vines. Ivy vines are easily bruised or broken when heavy weight is placed upon the stems and leaves. This damage can seriously limit the life and the looks of the ivy bed. If you are not going to completely remove the ivy bed, you have to be careful that you do not walk on the vines that you want to retain.

To keep from damaging the vines, carefully move the desirable vines aside and step on the bare ground or strategically place temporary concrete pavers where you need to step while working. For heavy cutting duty use sharp pruning loppers and for finer work, small hand shears that cut well. To reach across the bed to work on the vines climbing the wall, use an extending ladder solidly braced to avoid slips and falls.

Usually the dead vines and leaves will be covered with dust, a reminder of the many wind storms that blow...
through our area. When working with the vines, the dust often becomes dislodged and airborne. I like to wear a good dust mask to avoid choking on the stuff.

To avoid possible scorpion stings, it is a good idea to wear a pair of sturdy work gloves. Even if you do not run across one of these desert residents, the gloves will definitely help prevent uncomfortable splinters, blisters, and sore hands.

Depending upon the size of the bed, a pruning project like this can produce a large pile of waste plant material. If you are into composting, the many leaves can be stripped from the vine and placed in a compost pile or used directly as a mulch in the vegetable garden. The vines and thicker stems can be cut up into short lengths and placed in the trash.

During the actual pruning, the first step is to deal with is the tangled mass of vines that grows up the wall. If possible, try to preserve some of the more vigorous vines so that they can later be retrained up the wall. Sometimes the mass of dead and living vines become so intertwined that the healthy vines become damaged and you have to take them out. Take your time and be sure that each cut is the right one to make. In some cases, there may be no other recourse than to simply cut everything back to ground level.

After dealing with the vines growing up the wall, it is time to remove any dead leaves or stems that may be cluttering up the horizontal bed. You will need to search out and carefully remove any brittle, dead stems and leaves laying flat on the surface of the bed. If you have someone helping, one part of the team can gently lift the healthy vine while another pulls out what is dead. However it is done, this work can be tedious and slow, but it is important to take the time and do the job right. The bed will look much better if the existing healthy vines can be preserved.

Once the pruning and thinning processes are complete, the last step will be to carefully rearrange the remaining vines as uniformly as possible throughout the bed. Some of the longer ones can be repositioned to start growing back up the wall, if desired. After working the vines, I like to spread a good multi-purpose fertilizer and deep water the bed to encourage new growth.

If you have an overgrown ivy bed, and know that you need to clean it out, I hope that these tips will help you get the job done effectively and quickly so that you can get finished and back in under the air conditioning during these hot summer days.
Southern Arizona is in the midst of a multi-year drought and right now there appears to be no end in sight.

I think we can all agree that drought in the desert is no laughing matter. We are all dependent upon water, for ourselves, our plants, and our animals. Without water, living things simply dry up and blow away. In Western Pinal County we are fortunate to have large aquifers of groundwater and the Central Arizona Project to supply us the water we need. However, even those resources are dependent upon precipitation in one way or another. If we do not use our water wisely, we could end up in deep trouble.

Yes, they have been predicting a spectacular summer rainy season this year. I hope that it happens, but most of us have grown so used to the spotty rainfall that has become the norm during this long dry spell that many will remain skeptical until the clouds form and the rains actually fall from the sky. Even if we do get a lot of moisture this summer, it will not necessarily mean that the drought is over. It has taken us a lot of years to get this dry and it will take multiple good years to get us back away from the brink.

If you doubt the seriousness of the drought, take a drive through the desert and look at the native plants. The prickly pear are shriveled and yellow. The shrubs are hunkered down and holding on. The saguaro cacti are closed up tight like an accordion in storage. The plants are telling us that it is dry out there. We really need to pay heed.

Barry Nelson, a senior policy analyst with the Natural Resources Defense Council, once said, “The last century was the century of water engineering. The next century is going to have to be the century of water efficiency.” In the 1900’s, we built reservoirs and canals; in the twenty first century, we need to figure out how to use those resources in the most efficient way. One way to use water efficiently in urban areas is to create drought-resistant landscapes.

A drought-resistant landscape is one that, with very little outside resources, holds its own with dry periods of spotty, reduced rainfall. Some might call them “sustainable.” A sustainable landscape is one that can thrive with little or no extra water, fertilizer, or care, even in times of drought. Just as we do not worry about the survival of our native plants under normal desert conditions, in sustainable desert landscapes we seek to enjoy an outdoor living area filled with plants that require little or no extra care. If a sustainable, drought-resistant landscape interests you, let’s take a moment to review some if its basic elements.

A drought-resistant landscape must foremost be built around a diverse selection of healthy drought tolerant varieties. Native plants common to our area like the creosote bush, foothills paloverde, and the stately saguaro will, with a just little extra water do quite well in most local soils. I say a little extra water because it is evident that those wild plants out on the desert are struggling right now on rainfall alone. Around our homes, we will need to irrigate to avoid the catastrophe of plant death, but the amount of water needed will be significantly less than other types of landscapes.

The choice of native plants will need to be carefully planned. Not all native plants are low water use. For example, the foothill palo verde tree with its sparse foliage and thick green bark is relatively drought resistant. The native mesquite needs a little more water but is still a good choice. The Arizona ash in its native habitat grows along streams in the desert is not well adapted to drought and absolutely must be irrigated regularly to maintain good plant health. Plant selection is critical in the creation and maintenance of drought-resistant landscapes.

Of course it is possible to create a successful desert landscape with non-native species, but some have higher water requirements than native plants and their needs must be factored in. Before adding any plants to your shopping list, it is important to know their water use requirement and have a plan to meet those needs if they exceed the local rainfall average, especially in times of drought.

Another rule for managing drought-resistant landscapes is to know the secrets of the plants. All desert plants have some mechanism, some way, to survive periods of below average rainfall. Some, such as the ocotillo, lose their leaves until the rains resume. Many protect themselves by shutting down active growth and...
development and rest until conditions improve. The creosote bush, for example, will look yellowish, thin, and spindly during times of drought but become lush and dark green during times of plentiful water. The white thorn acacia in the desert is pretty much leafless, waiting for the summer rains.

There is another principle to remember: patience. We sometimes have to tolerate plants that may not look their best during times of drought. With that tolerance, we can have the full expectation that they will eventually return to their normal, vibrant selves when rains return.

Yes, I know that Arizona native plants and their desert-adapted cousins should be able to survive times of extended drought fairly well, but there is always that breaking point beyond which a particular species will begin to suffer damage and eventual death. There are few plants that can go indefinitely without water. Even if you are planning a landscape filled with native plants, an irrigation system can help minimize stress to even the hardiest of plants during times of drought. With the right plants, you may not have to run it often, but it will come in handy.

Desert-adapted plants, just like any other plant, must be planted correctly. There are definite rules to follow. Recent research has shown that a majority of tree and shrub roots lie within the top two feet of soil and extend one and a half to four times the width of the crown, the aboveground portion of the plant. The best planting hole, then, is not deep, but wide; three to five times the diameter of the root ball, but only as deep as the plant is located within the container. Planted correctly, all plants are better able to resist drought.

hen planting desert adapted plants be sure not to mix in any organic matter or other amendments into the soil because desert plants do not need it. If compost or forest mulch is available, a layer of decomposed organic matter can be layered on the surface of the soil after planting to help slow water evaporation from the soil and to help keep the roots cool.

The plant will need to be irrigated during the actual back filling process to prevent the formation of harmful air pockets within the root zone and to make sure that all of the roots do not dry out during planting. Until new growth resumes, it is a good idea to water the plant every other day or so to keep the root ball from drying out. Once the roots begin to grow, as evidenced by new growth in the stems, the irrigation frequency can gradually be cut back.

Correct plant selection, proper planning for irrigation needs and good planting habits will help you install and manage an effective, sustainable, drought-resistant landscape that will leave you completely satisfied that you are doing your best to conserve water and still have the type of landscape that will bring joy and value to your outdoor living space.
One of the reasons trees, shrubs, and other plants up and die is that sometimes they just flat run out of energy.

All living things need energy to survive. For example, animals require energy to move around and do what they need to do. If they run short, they are less efficient. If they cross a critical point of no return, they starve to death. Plants are in the same boat. If they cross a point of no return, they too can dwindle and die.

“But wait!” you say. “How can plants starve to death if they have the ability to manufacture their own energy through photosynthesis?” That is a logical question, but the answer is just as logical. Something or someone steals it from them.

There are many things that rob a plant of energy. Insects, diseases, poor nutrition, improper watering, wind damage, and misinformed pruning can all have an effect. Sometimes it is just one thing; sometimes it is an accumulation of many things. The end result can be fatal.

To understand the importance of energy flow within a plant, we need to understand two basic principles of botany. First, plants do indeed manufacture their own energy from the sun. Left alone in their normal state, most plants will never run short. Unfortunately, few plants are left alone. They have to fight off insects, withstand disease, struggle against drought, and fight for nutrients. Sometimes they win; sometimes they lose.

Second, there is the critical issue of balance. If a plant can stay in balance, it usually flourishes. Healthy trees and shrubs can withstand a lot of adversity, fight off a lot of insects, and recover at a faster rate when catastrophe occurs. A plant consistently out of balance is less resilient and more susceptible to even the smallest stress.

“Rick, please define balance.” Here is the rule of thumb that I use: “There must be a balance of energy between the top of the plant and the bottom of the plant.” The top of the plant are the parts that we can see; that is, the parts above ground. The bottom of the plant are those parts which are unseen below the surface of the soil. Overall, the total energy stored within the plant will be equally balanced between the above ground and below ground parts.

This balance thing is important because a healthy bottom usually means a healthy top. Conversely, a sick top usually means a sick bottom. If the top of your plant looks sick or is dying back, it usually means that something similar is happening in the roots because the plant tends to balance its energy. Healthy trees and shrubs enjoy a proper balance of energy. Sick plants are generally short.

The concept of energy balance is particularly important when we consider perennial trees and shrubs, that is, plants that live for more than three years. Annual plants, those that germinate, grow, reproduce, and die in one year are not all that affected by energy storage problems; they are going to do their thing and then die before the calendar flips.

Perennial plants, however, are greatly impacted when the energy balance is out of whack and it sometimes takes a long time to recover. The process of building up energy can be really slow, multiple years sometimes. As a result, perennial plants consistently short of energy don’t grow like we want them to grow or set fruit like we want them to set. They just don’t bounce back as fast when they are subjected to some kind of stress.

When we force plants to live “hand to mouth,” we are really putting them at an unfair disadvantage. Plants with little or no energy storage are generally at the mercy of the next crisis that may come along. The slightest interruption or reduction in photosynthesis, for any reason, could end in catastrophe. Plants living on the edge could collapse and fail for the very reason that they have no reserve energy to pull them out of the dive. They have no margin for error.

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Low energy plants are easy to recognize. Stunted growth, yellow leaves, reduced fruit and flower production, and weak, spindly plants all are indications of a poor balance of energy. When we look at a salt burned leaf or a floppy plant, it is logical and easy to just focus on the obvious cause, but it is really important to also consider what the overall impact of the collective problems are having on the energy storage of the plant. It may not really be the "bug" that is killing the tree. It may be simply that the accumulated problems are stealing away the energy the plant needs to recover.

I suspect this all sounds a little confusing, but take the word of someone who has seen a lot of sick plants during his career. Energy balance is really important. Anything that you can do to protect the energy production and storage capacity of a plant will pay dividends down the road.

What can you do? Avoid over aggressive pruning that removes a lot of wood at one time. Heavy pruning is one of the biggest reasons plants lose energy. When you see pruned branches laying on the ground, think about all of the lost energy the plant so diligently stored in that wood.

In addition, proper irrigation, timely fertilization, and overall good management of insect, disease and other pests will help the plant carry out its life functions in the proper way. Good management care and reduced stress on the plant will help ensure a proper balance of energy.

I can’t end without telling you the flip side of the coin. If you have a tree, shrub or weed that is particularly bothersome, you can kill it by draining it of energy. Take bermudagrass for example. It is possible to eventually kill it out by growing it to death. Irrigate it to get it to grow, then after it has expended energy from the roots to get up to about one inch tall, cut it back to ground level. Repeated treatments will eventually cause the plant to run out of energy and die. It takes a long time, but it does work.

We need to work together to keep our trees and shrubs healthy and vigorous. By ensuring that plenty of energy is stored in the various parts of the plant, and ensuring that any energy used by the plant is properly replaced, we can maintain healthy and productive trees and shrubs.

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 and leave a message, or call (520)374-6263 to reach one of our volunteer Master Gardeners. When leaving a message, please clearly state your name and your telephone number. 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. You are also welcome to stop by our office at 820 E. Cottonwood Lane, Bldg. C in Casa Grande.

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