Mistletoe: An Enemy To Plants

Because they have the unique ability to take energy directly from another plant, the various species of mistletoe can cause the slow, steady decline of host trees and shrubs.

Mistletoes are perennial, shrubby, woody or semi-woody flowering plants that attach themselves to other plants and steal water and nutrients from the host plant. Because they are dependent upon these host plants for nourishment, they are called parasites. Unlike dodder, which lacks any ability to produce food for itself, the mistletoes do contain the green pigment chlorophyll that allows them to manufacture food from the energy of the sun.

In the desert Southwest, there are about a dozen different species of mistletoe that affect trees and shrubs. Each of these species have the ability to invade the living tissue of host plants and extract water and nutrients for their own growth and development. It is this unceasing loss of strength, coupled with the twisting and distortion of branches caused by the mistletoe that can eventually lead to the decline and sometimes death of trees and shrubs.

The traditional European mistletoe is Viscum album, but in the United States two genera, Arceuthobium and Phoradendron are the representatives of the family. Arceuthobium species are dwarf mistletoes and are weak, herbaceous plants with leafless yellow-green to orange stems. These mistletoes parasitize pines and junipers all across the Southwest. Members of the Phoradendron generally have well-developed leaves on strong, shrubby, almost woody stems. Some species have large, yellow-green leaves while other species are essentially leafless. The common desert mistletoe that infests many of the desert legume trees like palo verde, mesquite, and ironwood has only scale-like leaves. The large-leafed yellow mistletoe is often picked and sold during the holiday season as a way to steal a kiss from someone special. It is most commonly found on riparian softwood trees like cottonwood, sycamore, willow and ash.
Most mistletoe species produce small white to pinkish or green-tinged berries, whose single hard seeds are surrounded by fleshy, sticky pulp. The fruit seems irresistible to birds, who then redistribute the seeds to new locations, not only through their droppings, but also by inadvertently carrying the sticky seeds on their beaks and feet.

While otherwise healthy host plants may seem to tolerate one or two mistletoe plants, the parasitic plant’s ability to effectively produce and disperse seeds all but insures the spread of the infestation and the slow decline and even death of the host plant. The weakening, disfigurement and eventual death of shade, food and lumber producing trees represents a significant worldwide economic loss each year.

Control of parasitic plants is often difficult. The easiest and most common method of control is to simply prune or break off the plants. This is best done before flowering to prevent the development and dispersal of seeds. Removal of the parasites also helps to reduce the drain on the host tree as pruning prevents the loss of valuable water and nutrients from the host.

Unfortunately, mistletoe pruned in this manner usually does not remove all of the parasitic plant, and the parasite will often grow back quickly. For this reason, frequent pruning is often necessary. To prevent frequent regrowth, remove the mistletoe as close to its point of attachment as possible. Some bark tissue may safely be removed during this process, but try not to cut too deeply, or the branch may snap under its own weight or in a wind.

A more permanent step would be to completely prune away infected limbs and branches up to 12 or more inches below the mistletoe point of attachment. This type of pruning works well for younger clumps of mistletoe, but it cannot be done on older growth mistletoe, or where the mistletoe is on large, often essential limbs. Be sure to prune the infected limbs back to their point of attachment with a larger branch or the trunk. Never leave the stub end of a branch that could invite the entry of other diseases and wood-destroying insects.

Where infestations occur on essential branches or on the trunks of trees, some measure of control can be achieved by pruning the offending mistletoe back flush with the tree and then wrapping the exposed points of attachment with dark, light-excluding plastic sheeting. The lack of light on the remaining parasite tissue will prevent the regrowth of the pest. As the mistletoe is deprived of sunlight, the parasite will eventually die. However, this make take a year or two, so it is important to check the plastic wrap regularly and replace it if it begins to degrade.

Mistletoe is a common pest on local landscape trees, but by careful vigilance and proper tree care much of the damage to, and death of, these valuable plants can be avoided.

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Sometimes our modern ways, effective though they may be, simply don’t match up to the simple practices of those who have gone before.

Growing healthy plants in our desert environment is not easy. The dryness, the heat, and the desert soils create a real challenge for those who try to grow food and ornamental plants. Today, we use lots of water, fertilizer, and other inputs to grow our garden and landscape plants.

One thousand years ago all the people had at their fingertips was the rain that fell from the sky, the water they could divert from the free-running rivers, the soil at hand, and whatever local materials they could find to eke out a living from the desert environment. They had to be thrifty and they had to do the right thing at the right time in order to survive.

The ancient farmers made a living in what now is central Arizona by using amazing technology to hammer out a niche for themselves. Most of us know that many of the modern canals carrying water today in the Salt and Gila River valleys follow the same tracks of canals laid out by the people from long ago. Other technologies included the use of adapted varieties that withstand the heat and dryness of the desert, terraces, gravel-mulched fields, and rock pile mulch systems.

While all of these technologies have modern applications, I would like to suggest the rock pile mulch system as an urban landscape tool.

A rock pile mulch system is not just any old mound of rocks. Those piles built by farmers from long ago were assembled with a specific purpose, construction, and function. They were used to grow useful, drought-tolerant plants, mainly species of Agave, on rainfall only. Those of us trying to grow landscape plants with less water get really excited just thinking about the possibilities!

Ancient rock piles are found all over Pinal County, but away from the irrigated fields that sustained the populations with corn, beans, squash and other crops. They apparently did not feel the need to use the technology in their irrigated fields, at least few piles so far have been associated with these old farmlands. They are plentiful, however, on the slopes and bajadas of the hills throughout the homeland of the ancients.

Suzanne Fish, an archaeologist with the University of Arizona, has researched rock piles in the Marana area. She and her colleagues found that most piles were made of cobblestones of various sizes usually piled loosely on top of a low mound of soil. The description sounds much like an early version of a raised bed garden, doesn’t it? The piles were generally small, the largest being about four to six feet in diameter and about thirty inches tall. Many, or maybe even most, were smaller. The cobble stones ranged in size from one inch in diameter to about six inches.

Rock piles benefit plants in several ways. Since water is often a limiting factor for plants growing in the desert, many of the benefits revolve around water in some way. For example, rain falling on the mounds penetrates through the rocks easily and soaks the soil underneath. The rocks then act as a mulch to slow evaporation of the stored water. Plants growing in rock piles generally have access to more water over a longer period of time.

While the hands that tended these rock fields have long since vanished, it is fascinating to see how these simple piles are still working today, even without human intervention. Dr. Fish reported that roots harvested from

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modern plants taking water from these piles weighed about 80% more than roots of similar plants growing in soil without the benefit of the piles. A large and healthy root system generally means a large and healthy plant.

Dr. Fish mentioned another benefit: prevention of rodent damage. Because the rocks in the piles make it tough for small animals to burrow down under the plant and eat the stem and roots, damage from these animals is minimized. I do not know if it would slow down the larger animals, like ground squirrels and gophers, but a rock pile should work well against pack rats, kangaroo rats, and other small mammals. No, I do not know if it would work against the dreaded agave snout weevil. We need more experience before we can venture comment on that particular pest, but I would not yet rule it out until we get more information.

There are other benefits and applications in a modern landscape. For example, a rock system should greatly benefit many of the forlorn century plants and other agaves that are growing alone and exposed in desert-landscaped yards. Agave plants in urban gardens seldom get watered. Think about it. Agaves are not really native to our low desert. Where do you see them growing naturally? They grow at higher elevations where there is more rain. The ancients successfully grew them at lower elevations because they used a rock mulch system.

When it comes right down to it, most water stingy plants growing in desert landscapes could potentially benefit from more available water spread out over a longer period of time. I have a small rock pile around our Texas sage bush and have seen good results. Creosote, cacti, acacia, and other species should see similar results. Consider the possible savings on the water bill when we do not have to irrigate so often.

Another possible application of the rock pile system would be a hill-planted vegetable garden. Some garden plants do very well growing together as companion plants in a hill formation, that is, multiple plants seeded in the same spot and growing from the same location. Corn, squash, and beans, the big three of ancient Native American cultures, work well together in a hill planting. Don’t get me wrong. I am not saying that ancient cultures regularly grew annual crops in rock piles, but there is a possibility that some annuals might have been occasionally planted as companions to agave in some situations.

A rock pile garden is intriguing because many people prefer to plant their gardens in raised beds. A rock pile garden would certainly look authentic, and planted with some of the ancient varieties that are beginning to be made available through native seed outlets such as Native Seed Search in Tucson, a rock pile garden would certainly be unique.

The down side of a rock pile garden would probably be less produce. It would most likely take a lot of rock piles to match the yield of a large conventional garden. Of course, nothing says that the rock piles have to be circular or even oval, they can be any size and shape and still work. If you are interested, use your imagination, give it a shot, and let me know how it works out. I would definitely be interested.

Planting vegetables in a rock pile may not be the best way to grow lots of healthy produce, but the ancient technology might be just the ticket to keep desert-adapted landscape trees, shrubs, and succulents happy in the midst of both our short term dry seasons and our long term drought.
Community gardens are becoming more and more popular in Pinal County. If you are thinking about organizing one in your area, here are some ideas to get you started.

According to the American Community Gardening Association, there are many benefits that come from a community garden. “Community gardens provide a catalyst for neighborhood and community development, stimulate social interaction, encourage self-reliance, beautify neighborhoods, produce nutritious food, reduce family food budgets, conserve resources, and create opportunities for recreation, exercise, therapy, and education.” Community gardens are a good way to build community pride, raise fresh fruits and vegetables, and meet new friends with similar interests.

In Pinal County, community gardens are blossoming in retirement communities, schoolyards, and city neighborhoods. Each is different in its own way but all of them share similarities. When setting up a community garden, it is important to really consider what we want it to do.

An obvious reason, and one that many place first in their thinking, is productivity. Most community gardens are designed to produce fruits, vegetables, and flowers for a specific purpose. It may be that a group of people may want to join forces to grow fresh, locally grown food. Others may have it in mind to help bring additional food resources to a community that may not have a grocery store nearby. Still others may simply want to beautify a corner or a city lot.

Whatever the motivation, a community garden is a garden space that is shared by different individuals, families, or working groups. Joint gardening efforts require patience, hard work, cooperation, and commitment in order to succeed.

Community gardens usually work best when each participant is assigned their own plot of ground instead of everyone working together on the full garden. In this last case, inevitably there will be those who feel that they are working harder and accomplishing more than others in the group. This often leads to conflict and hard feelings. When individuals or families have their own area to work, the potential for conflict is minimized. Working together under either scenario requires a shared understanding on the part of all individuals, a vision of what is to be achieved, and a clear plan to make it happen. When these basic principles are violated, or do not exist, chaos can occur.

For these reasons, before any other plans are laid, it is important for participants to create a forum for planning and sharing. This will require that participants come together in some form of a public meeting. It is in these meetings that group decisions are made. One of the first decisions is to decide whether a community garden is right for the group. Everyone in the group should have an understanding of what is to be done, who is expected to do the various tasks, and an agreement on a time line for accomplishing the work. Each person or family should come away with a firm commitment to lend a hand and do their part.

There will need to be some type of planning committee, someone who can coordinate the work. There are many details that must be coordinated and produced at the proper place and at the proper time. Resources like seeds, tools, and fertilizers must be made available and properly maintained. The planning committee can help coordinate these tasks. There will be questions of funding, space allotment, youth activities, construction, maintenance, and much more, all of which can be facilitated by the planning committee. Members of this committee must be committed to the success of the garden and have the time to devote to the project.

Most successful community gardens have a sponsor, that is, someone or some group that will be willing to help with donations of needed materials or space. A sponsor is not always necessary, especially if the group is willing to
support the group with dues or membership fees, but a sponsor can be the difference between success and failure in many community gardens.

There are several key factors to consider when selecting a site for a community garden. The first is water. It has to come from somewhere, and water is expensive. Someone has to pay for it, donate it, and make it available. That can be a huge investment. Fortunate is the community garden where a sponsor provides the water. If no sponsor is available, the planning committee must figure it out.

Another factor is the soil. It must be of sufficient quality to support the growth of plants. It is best to select a site that is free of caliche, salts, discarded contaminants like engine oil or other chemicals, and perennial weeds like bermudagrass, nutsedge, and silverleaf nightshade. A soil with some sand as part of the mixture will provide the good water drainage that is so critical for plant health.

If the site is new for gardening, it will need to be deeply tilled to loosen the soil, amended with decomposed organic matter, leveled, and formed into beds. Some type of irrigation system will need to be designed and installed. I recommend drip irrigation because it is easier to manage and tends to use less water than other systems. All participants will need to be prepared to properly seed, fertilize, irrigate, weed, and provide for pest control. All of these should be discussed by the group in advance and have agreement on the steps to be taken. For example, if the garden will be grown under organic specifications, all of the participants will need to be in agreement and prepared to use organic pest control techniques to avoid contaminating a neighbor’s garden bed with conventional insecticides or herbicides.

The garden must be divided up into plots and assigned out based upon a previously agreed upon system. The allocation of plots can be first come-first serve, by lottery, or by some other system of distribution. Many community gardens allow their participants to select their site based upon the drawing of lots to determine selection order.

There will need to be space set aside for secure storage of tools and supplies. If composting is part of the garden plan, it will be important to set aside space for that activity. Most composting systems as a minimum set aside three bins of at least three feet by three feet by three feet to provide sufficient volume for proper composting to occur. Paths between each garden bed that are at least twenty four inches wide will allow for foot traffic and provide access for wheelbarrows and small garden carts.

Most successful community gardens develop a set of written rules and give them to their members. This allows all to know what the rules are and to know what is expected of them. It is a fact of human nature that we are more willing to abide by rules that we ourselves helped create, so it is important that this function be part of the agenda for early group meetings. The planning committee can help facilitate the discussion and distribution of the rules.

Good communication is essential. When all know what is expected and have an active part in developing future plans, excitement for the project generally will remain strong and vibrant. For this purpose, many community gardens have an all weather bulletin board where notices and communications are posted.

If children are part of the group, many community garden organizations create special areas for them to work their own plots. Here they can plant whatever they want and work at their own speed. Special garden related activities help them keep interest in the garden.

A community garden can be an engaging and fun experience but planning is critical. The rewards will be obvious when a bumper crop is shared with family and friends.
Healthy trees and shrubs are a valuable addition to any landscape, but any hope of maintaining them in good condition over long periods of time is entirely dependent upon the care that they receive.

Trees and shrubs that look good and perform well add value, shade, and a pleasant appearance to any landscape, but sick plants can do exactly the opposite. It is important to keep trees and shrubs looking their best by giving them good care throughout their lives. Early decisions though can pretty much determine whether new additions to a landscape will succeed or fail. Two of the very first keys for developing successful landscape plants are the selection and planting of good stock.

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

When selecting potted or boxed trees it is important to ask several key questions. What is the history of the plant? How long has it been in the container? Does the plant have any obvious defects? Most people do not purchase a car unless they have checked on the parts that are not readily seen. The same is true for plants.

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

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

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

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

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

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

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

Be careful of placing too much torque, twisting and jerking, on the root ball because the feeder roots contain tiny root hairs that do the business of taking up water and nutrients. Torque can rip and tear these important structures and lead to transplant shock.

Backfill the planting hole with the same soil that came from the planting soil and add mulch, not to the soil returned to the soil, but to the surface of the soil to cool the soil surface and cut down on water loss through evaporation. Mixing mulch to the planting soil can create more problems than it is worth. For example, soil organic matter does not last long in our desert soils because of the feeding of soil microflora. Besides, some native desert plants, like mesquite and palo verde, seem to do much better in native soil alone.

Please remember this one last thought. Larger trees that fail because of root problems stemming from pot bound conditions can become potential safety and liability problems. I once saw an Aleppo Pine with a trunk diameter of 24 to 36 inches snapped off during a windstorm. The loss of this beautiful tree was caused by a girdling root that had prevented the proper development of trunk wood. The total diameter of healthy wood that was supporting the larger than average tree was about 4 inches! Fortunately, the tree fell towards the street and not towards the home.

Armed with knowledge and a little experience, it is possible to properly select and care for our landscape trees and shrubs. It is this proper care than will ensure a long and successful life in our landscapes.

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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Richard D. Gibson
Extension Agent, Agriculture

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