

Backyards & Beyond

Fall 2009

RURAL LIVING IN ARIZONA

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Featured Plant

Common Name: Velvet Mesquite
Scientific Name: *Prosopis velutina*



Jack Kelly

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Velvet mesquite is one of the most majestic and long-lived trees in the deserts of Arizona. These stately trees can live several hundred years and are often found along waterways and drainages throughout central and southern Arizona and into Mexico. Under ideal conditions, a velvet mesquite may grow up to 30 ft. tall with a four feet diameter, and a canopy spread of 30 ft.

In recent years several other species of mesquite have been introduced into Arizona for the landscape industry.

These rapidly growing trees have had major problems with establishment and have inherent genetic problems that make the velvet mesquite a better choice. Given water and favorable soils, they will grow into magnificent trees in as little as 20 years.

How do you identify a velvet mesquite? The tree derives its name from the velvet-like feel or texture of the tiny short gray hairs that cover most parts of a younger plant. The leaves have one or two pairs of pinnae (small leaves) and up to 30 pairs of leaflets attached to the pinnae. They may be found as a single-trunked tree when growing in bosques (thickets), or as a multi-stemmed tree in open areas. The bark is fissured and dark brown and rough. When the tree is young it may have small thorns that will mostly disappear with maturity.

After the first hard freeze of winter the tree drops its leaves revealing the true beauty of the velvet mesquite. The trunk is beautifully sculpted and dramatic branches sometimes swoop down to the ground. No two trees are alike and each has a special appearance.

When spring arrives, the velvet mesquite is one of the last plants to leaf out. Old timers say that 'a mesquite never gets caught in a late freeze'. After leafing out, two to three inch yellow caterpillar-like flowers called catkins adorn the tree and are soon followed by tan bean pods which ripen mid to late summer. Native peoples milled the pods into a highly nutritious flour and interestingly today the flour is an ingredient used by high-end restaurants in their bread.

The wood, which is often cut while thinning dense stands or removed from grasslands during habitat restoration, is prized for its value in furniture making due to its beautiful coloration, intricate grain and durability. Very little is wasted when harvesting mesquite, the root burls make one-of-a-kind lamp bases, the larger trunks are milled into planks for furniture, smaller branches are sold as firewood and the 'scrap' is chipped into small pieces used in open-fire or smoked cooking. Most mesquite charcoal comes from Mexico which has unfortunately led to the loss of some of the largest specimens of velvet mesquite. When you drive through many communities during winter the fragrance of velvet mesquite fills the air. It is this same wood that imparts that delicious southwestern flavor to steak or other meat that is slow cooked over a mesquite fire-the velvet mesquite.

Featured Bird

Common Name: House Finch
Scientific Name: *Carpodacus mexicanus*



Dan L. Fischer

Dan L. Fischer – Author of *Early Southwest Ornithologists, 1528-1900*, University of Arizona Press

The common name given the House Finch certainly seems reasonable for it refers to a close association with humans and their dwellings. Some of the earliest western observations of this bird were by Dr. Samuel W. Woodhouse while on a reconnaissance for a westward wagon route from Santa Fe under the command of Lt. Lorenzo Sitgreaves in 1851. Two

years later, Dr. Caleb B. R. Kennerly and Baldwin Möllhausen, members of the Whipple Railroad Survey, following a similar route (along the 35th parallel) in northern New Mexico and Arizona, observed them "frequenting the houses and building about the churches" of the upper Rio Grande. Although one of the most common native birds of Arizona and frequently seen, it is often ignored or taken for granted.

Even for the casual observer, two noteworthy features should be mentioned regarding the resourceful little House Finch. First is the strikingly beautiful plumage of the male which exhibits an assortment of reds from crimson to yellow on the head, throat, breast and rump. These colors contrast sharply from their otherwise grayish brown body. The variable pigmentation displayed in the plumage of the male is dependent on their diet. The female is similar but without the rich reddish coloration and appears more uniform grayish brown with a lighter breast that has dark brown streaks.

With the return of spring, the second notable feature begins with the emergence of an uplifting chorus of song by the handsome male. His warbling resounds with notes of upmost cheerfulness and is often repeated with a continuous delightful flow. During courtship the male persists in hopping and displaying about a chosen female with crest feathers raised, head and tail upright, and wings drooping while continuously singing his lovely song.

Although frequently occurring about human habitation as their designated name suggests, the House Finch is quite adaptable to other environments ranging from the low desert areas and riparian drainages to the higher elevations of open ponderosa forest. Generally they are in close proximity to some water source.

Their nest consisting of a cup of fine weeds and grasses is built by the female in a variety of situations from buildings, shrubs, cavities and cholla. The female builds the nest and incubates three to five pale blue eggs, sometimes lightly speckled or streaked dark olive, which hatch in about 13 days. During this period the female is fed on the nest by the male and they both join in feeding the young. After fifteen days the young leave the nest. House Finches may produce up to three broods per season.

German naturalist P. L. S. Müller applied the generic name of *mexicanus* to the House Finch in 1776, after describing the bird from a specimen secured from "the valley of Mexico."

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Yin Yang



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Aspen's "10 Most Wanted" List

Tom DeGomez, Area Extension Agent, University of Arizona Cooperative Extension, Coconino and Mohave Counties

Aspen trees grace our high elevation areas in Arizona, both in the wild and in landscapes. However, this beloved tree has more than its fair share of insects and diseases that can reduce its growth, cause its white bark to discolor and decay, cause branches to wither and die, and disfigure its foliage. It is hard to decide which of its many pests is the worst of the bunch, but here are the top "10 Most Wanted" for damage to aspen.

Cryptosphaeria canker (Photo 1) and the American hornet moth (Photo 2) certainly are at the top of the list for damage. Nearly as devastating are several other canker diseases: *Cytospora*, *Hypoxylon*, and sooty bark. If left untreated the insect oystershell scale will eventually kill trees.

Severe outbreaks of the fungal disease black leaf spot can cause trees to defoliate which will lead to a fall without their stunning color. Western tent caterpillar and the fall webworm will defoliate trees in the summer and fall respectively. Last on the list are the aphids that can cause leaves to be mis-shaped and discolored.

Prevention and Control

Several wound-invading fungi cause the majority of damage to aspen. Once the canker forming fungi have invaded an aspen there is little that can be done other than prune out the infection. With *Cryptosphaeria* canker it is recommended to prune at least 18 inches below the infection. If the canker is high on a side branch pruning may not affect the overall integrity of the tree, but if it is lower on a limb or trunk it often means removing the tree entirely. The most common causes of cankers are wounds to the bark. To prevent wounding, avoid hitting trees with lawn mowers, using trees as supports for hammocks, volleyball nets or wood piles. Elk, deer, sapsuckers, and children armed with toys of various sorts can cause wounds that can easily become infected.

The wood boring American hornet moth larvae can be prevented with regular insecticide sprays to the base of the tree. Frequent inspection for boring at the base of the tree is important to detect tunneling larvae. Once an attack has been detected, a solution of an insect feeding nematode can be injected into the tunnels. Larvae can also be dug out of the wood or killed by pushing a wire into the hole.

Oystershell scale is best controlled by brushing these tiny insects off the trunk and limbs with a stiff nylon brush. Spraying dormant oil prior to bud break can also be helpful in preventing their spread.



Photo 1. *Cryptosphaeria* canker in aspen.

Black leaf spot is best prevented by raking up infected leaves and destroying them. Fungicides may help prevent further spread of the disease once an infection has started.

The western tent caterpillar and the fall webworm are most serious on young trees but can be easily pruned out of the tree when they are resting in their webs. The bacteria insecticide *Bacillus thuringiensis* (B.t.) var. *kurstaki* or *berliner* provides excellent control of feeding larva when sprayed on the leaves.

Aphid infestations can be reduced by controlling the activity of aphid-nurturing ants on the trees. Tanglefoot, a sticky paste, can be applied to the base of the tree to prevent ants from moving up and down the tree. A strong stream of water sprayed into the canopy can dislodge the insects, preventing them from feeding and reproducing. Insecticides are also available for aphid control.

Growing healthy, beautiful aspen trees can be a challenge. Increased knowledge of the "10 Most Wanted" enemies can help prevent and control infestations before they spoil your trees.

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Photo 2. American hornet moth damage.

Tom DeGomez

Cooperative Weed Management Areas

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Figure 1. Russian knapweed is a noxious, invasive plant that infests yards, river bottoms, roadways and abandoned fields in eight Arizona counties. It causes chewing disease in horses, whether green or dried.

Invasive and noxious weeds are of concern no matter where you may live in Arizona. “Invasive” weeds are plants that are introduced into an area outside of their original native range. They become problematic in their new environment by interfering with native or desirable species. The National Invasive Species Management Plan defines invasive species as “a species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.”

“Noxious” weeds are regulated and defined as any plant designated by a federal, state, county, or municipal government to be injurious to public health, agriculture, recreation, wildlife, or property. They are regulated with respect to their transport, sale, and eradication efforts. Federally listed species (plants and animals) can be found on the USDA’s Animal and Plant Health Inspection Service (APHIS) web site; while state listed weeds can be found on the Arizona Department of Agriculture website (both are listed below). Not all invasive plants that have encroached into Arizona’s lands and waters are noxious weeds. However, invasive plants that are not listed as noxious weeds are still serious pests.

In addition to the listings above, Arizona’s Governor approved the Arizona Invasive Species Management Plan in 2008. This plan outlines strategies to battle the increase in invasive species infestations in the state (plants and animals). While these efforts keep federal and state agencies focused on harmful non-native species, there is a third level of focus—local Weed Management Areas (WMAs). These groups are composed of local agency personnel and landowners, concerned citizens, conservation organizations, etc. who work to address foreign weed problems in their communities.

There are about twenty recognized weed management groups in Arizona and they vary in their scope and size. All are comprised of volunteers and agency personnel who have a passion for controlling noxious and/or invasive weeds, sustaining our natural landscapes, preventing catastrophic events, and averting human health problems caused by these plants. These are different than weed control boards found in some other states that have regulatory authority and are supported by tax dollars. Arizona’s WMA’s are volunteer-based, have no regulatory power, and rely on grant funding to implement large scale projects. Since invasive weeds establish infestations on a variety of landownership, WMA’s are important in pulling together people who might not normally work together on private, municipal, county, state, tribal and federal lands and waters.

Weed Management Areas use the principals of Integrated Weed Management:

- Education/Awareness,
- Prevention/Early Detection,
- Inventory,
- Treatment (including physical, biological, cultural and chemical methods),
- Monitoring, and
- Long term follow-up.

Members of WMA’s may work in one or two of the areas listed above, or may be involved in more, depending how the WMA is set up and what species they may be targeting. Some examples of WMA activities include: educational workshops for local communities, mapping weed infestations, organizing weed pulls, researching alternative treatment methods, and photographing and monitoring previously treated infestation area.

The least expensive weed control effort is preventing new weed introductions. Educated and involved citizens can make huge contributions to weed management through WMAs. Whether it’s removing noxious weeds from your own land to helping with educational events, volunteers are always welcome. Contact your local Cooperative Extension office or check out the weed management area contact list on the Southwest Vegetation Management Association website listed below to find a weed management area near you.

Internet Resources

USDA-APHIS Federally Listed Plants
http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/

Arizona Department of Agriculture Listed Plants
<http://www.azda.gov/PSD/quarantine5.htm>

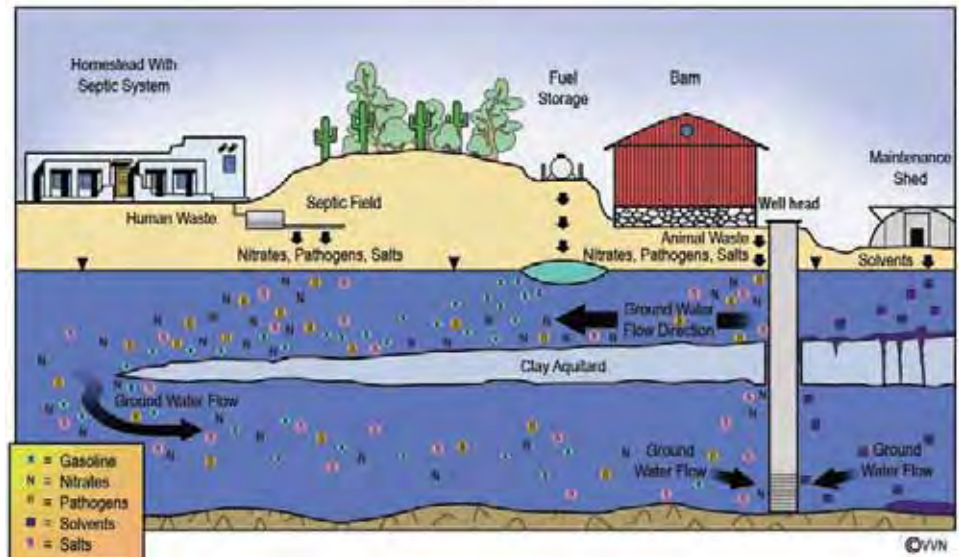
Arizona Invasive Species Advisory Council
<http://az.gov/invasivespecies/about.html>

Southwest Vegetation Management Association
<http://www.swvma.org/>

A Well Owner's Guide for Arizonans

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This figure from the well owner's guide shows a cross-section of a well, and sources and types of contaminants found in aquifers. Protecting a water supply includes identifying contaminants (see box insert) and removing potential sources of contamination. Well head protection is important since wells are direct conduits to groundwater (GW). Other common sources of GW contaminants are intercepting seepage from the septic field, a leaky fuel storage tank, and chemicals stored in a maintenance shed. When the pump is on, the change in groundwater flow direction pulls the contaminants into the well. (Source: *Arizona Well Owner's Guide to Water Supply*. University of Arizona, College of Agricultural and Life Sciences, Arizona Cooperative Extension publication #AZ1485).



In Arizona the number of new domestic wells now exceeds 3,000 each year, with an estimated 93,000 wells across the State. These private wells provide water supply to an estimated 120,000 households, or about 5% of the state's population.

The University of Arizona Cooperative Extension is publishing the *Arizona Well Owner's Guide To Water Supply* booklet (publication # AZ1485, 2009) and will be sponsoring a series of workshops to assist the well owner in the maintenance of their water supply, encouraging routine testing and monitoring the quality of water.

During the development of this guide, the authors strived to communicate to the reader (private well owner) three major points. First, aquifers are a shared (common) source of water. Second, wells must be properly constructed, maintained and protected (in particular at the well head) to insure a safe water supply. Thirdly, well owners are responsible for the quality and safety of their well water and should therefore test the water quality frequently. The well owner's guide provides context for these points with background information on Arizona geology, water sources, water quality standards, and water treatment options.

Included in the guide is an overview of the state's water resources and how Arizona's major cities use these supplies. Descriptions of the three regions of the state with similar geology and climate (physiographic provinces) are provided. In addition, Arizona's aquifer materials, types, and their water flow (transmissivity) characteristics are described.

Common naturally occurring constituents that may be toxic to human health in elevated concentrations are discussed, including: arsenic; radioactive elements; nitrate; pathogenic organisms; and, fluoride. Examples of human-made (anthropogenic) contaminants are provided, including new, emerging chemical and biological water contaminants.

The importance of appropriate maintenance of septic systems and general landscape housekeeping is also discussed, as many water well contaminants originate near the well head. The transport of contaminants and the vulnerability of private wells to contamination are explained at a technical level comfortable to the lay person. Routine well sampling is emphasized, with specific analysis recommended based on well location in the state.

Although these private wells are exempt from regulation in Arizona, a discussion of primary and secondary regulatory maximum contaminant levels (MCLs) is included in the guide to prepare the well owner to select appropriate water treatment options.

This spiral-bound, 76-page guide was published in full color and, contains numerous graphics, a glossary of technical terms, and an extensive list of websites of interest. The appendix section contains tables of the National Drinking Water Standards, water problems, symptoms, possible sources, and water treatment options.

Arizona well owners are encouraged to obtain a copy of this guide. Electronic (pdf format) and hard copies can be downloaded or purchased from the following University of Arizona, College of Agriculture and Life Sciences websites:

Publications Distribution Center: <http://cals.arizona.edu/extension/publications.html>

The Water Resources Research Center: <http://cals.arizona.edu/AZWATER/>

Backyard Erosion— a NIMBY Situation

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E*rode vt, to eat or
wear away, as soil by the
action of water

E*ro*sion n, action of water
and wind wearing away the soil
surface

Nim*bee n, not in my back
yard



Barbara Clark

Rill erosion on a
fairly steep grade.

Why would anyone think of erosion as something you wouldn't want in your backyard? As a matter of fact, who even thinks about erosion as something pertinent to everyday lives out here beyond the sidewalks? Erosion of what? Family values or faith in the stock market? Neither; the kind of erosion addressed here is much more basic than even those topics—and it has to do with the fundamental underpinning for our living world: the state of the soil. Perhaps we should say “The State of the Soil” because it is so basic to the health of the watershed. Uh-oh, a healthy watershed? New concept to you? Don't have a shed for water? Yes you do, and it's the soil in your backyard.

Your backyard is part of a larger watershed, which can be very simply described as the “land on which water falls from the atmosphere; this water may be stored within the soil, and, over a period of time, is released downslope to other locations.”¹ Every part of a watershed is important and so, your backyard is important not only to you, but to the larger landscape around it.

Most important to your backyard, conditions on the land determine how well the rainfall is absorbed into the soil and that in turn indicates how your backyard watershed is functioning. If you take the time to observe how rainfall behaves when it hits the soil on your property, or note the after-effects of a strong rainfall event, you will have taken the first step towards understanding if the soil in your backyard is acting like a sponge and absorbing rainfall or if the soil is being carried off in runoff as water flows over the land.

Soil erosion is a “non-point source pollutant” because we don't always know where it comes from, yet it impairs downstream water quality and can affect aquatic wildlife. Closer to home in our backyards, this stormwater runoff further degrades on-site soil conditions and causes a variety of annoying problems on your property.

There are actions that you can take to solve some of those erosion problems, but let's talk first a bit more about “The State of the Soil” since it is the foundation upon which our living world depends. You will be enhancing effective use of rainfall if you build soil sponge capacity and you will solve erosion problems on your site if water can infiltrate the soil instead of removing it by flowing overland in sheet flow, rills (small erosional rivulets), and those ever-expanding gullies.

In many of our desert backyards, soil structure has been negatively impacted by a variety of extraordinary disturbances. Perhaps unmanaged grazing has removed too much plant cover, construction has removed topsoil, or road excavation has changed drainage patterns. The above- and below-ground plant communities in semi-desert landscapes are well adapted to drought and wildfire, but very sensitive to additional disturbances, depending on the timing (when it happens), intensity (how severe it is), and frequency (how often it occurs). Sometimes these disturbances are so extreme that they are beyond what a desert ecosystem is adapted to handle and regenerate. The system loses its ability to recover (resiliency), because it lost the variety of elements (biodiversity) that contribute to a living soil.

¹ Nevada Association of Conservation Districts, 1995, *Nonpoint Source Management Program*



Headcut soil erosion is the start of gully formation.

So, walk around your backyard and take a good hard look at the soil conditions. Topsoil in our desert climate is typically less than four inches deep. It has plant roots, fungi, worms and insects and supports a variety of plants and small animals. Dead organic material (litter) covers and provides soil surface protection and as it decomposes, humus is produced by microorganisms. This provides spaces between the mineral particles of your soil which means that the soil structure can both absorb water and support more plant growth (cover).

Plants provide food and shelter to small animals, insects, and birds which in turn contribute their additions (manure, carcasses) to the process. The leaves and branches of plants also provide soil surface protection. They soften the impact of hard rainfall, which can further compact soil particles. They also provide shade for the soil, lowering evaporation rates and keeping moisture in the soil longer.

If you find that the soil surface does not have a living plant cover and/or a litter of dead plant material, chances are that its ability to absorb water has been seriously degraded. You may note that the top layer of soil is hardened or removed. Because of this “capping”, precipitation runs over the land surface instead of infiltrating into the soil. Without moisture, the soil’s ability to absorb water and sustain plant growth further declines.

To change this negative cycle of excessive rainwater runoff, we have to help the soil retain more water. To start that regenerative process, runoff must be slowed down. This gives the water more time to soften the hard soil crust, permeate the soil particles, and activate the soil fungi that help support plant roots. Rainfall that is captured on-site benefits the existing plant life, which in turn further protects the soil surface. Dormant seeds may get the opportunity to sprout. Plants also protect the soil from wind erosion (blowing dust) with both their leaves and roots as well as helping it stay in place when heavy rainfall events happen.

There are several ways to slow down stormwater runoff and stop erosion in your backyard. “Technically, erosion occurs when there is insufficient cover to protect the soil’s surface from raindrop impact or the shear stress of flowing water. Erosion worsens with increasing slope angle, slope length, and fragility of the soil.”² You will need to research these techniques and match the treatment to your site conditions. Basically, you will be trying to harvest rainfall to restore the sponge capacity of the soil.

As you assess your land, you may see patterns of soil loss that are called sheet flow (water running overland), rills (small rivulets), or gullies (deeper incised trenches). These will lead to washes or arroyos. Start to harvest water at the top of your watershed—the highest part of your property. Start small, where the water has not reached a larger wash. Don’t necessarily try to retain all the runoff; your goal is to slow it down, spread it out, and let some of it soak in. This way you can dissipate the erosive force of the flowing water and retain soil particles, organic material, and moisture. If you start small, you will have the opportunity to learn if what you did was effective and build on that, rather than having to deal with the unintended consequence of poorly designed or executed measures that might add to the problem.

Water harvesting on slopes can be done by placing barriers on the contours of your land. They can be made from locally available materials, including soil, rocks, straw bales, logs and branches, and straw wattles. Structures that slow the water down are rather low and meant to be breached. Some structures might be used to retain or divert storm water runoff and they are high enough to direct the overland flow to where it can be safely used. Applying mulch over the soil surface is always a very good start to healing the soil.

Water harvesting to heal gullies on flatter ground can be done with grade control structures, induced meandering, and revegetation. The speed and force of runoff is concentrated in gullies and grade control structures are low in profile to prevent the gully from becoming deeper and promote soil retention and subsequent plant growth. Directing the flow of water from side to side in a stream channel also slows erosive forces.

The purpose of this brief discussion on soil erosion is to acquaint you with the concept of protecting and nurturing our desert soils, the life-giving dirt in your back yard. Now that you can “see what you are looking at” when you walk your land, you are encouraged to look further into the many techniques available to help build soil capacity by restoring the sponge in your own backyard ‘shed!

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² Bill Zeedyk and Jan-Willem Jansens, 2006, *An Introduction to Erosion Control*

Using Cut Stump Application of Herbicides to Manage Woody Vegetation

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Jeff Schalau

Persistent woody plants can sometimes interfere with gardening and landscape objectives. In some instances, appropriate pruning can be used to simply reduce the size of the plant. However, there are many instances where complete removal is warranted. Examples include: trees and shrubs that cause structural damage to foundations and/or plumbing, reducing vegetation density to create wildfire defensible space, and invasive species control. When a plant is targeted for removal, consideration should be given as to whether or not that species will resprout from the cut stump. Under some conditions, manual or mechanical removal of resprouting stumps may not be practical. In these cases, herbicides may be applied to freshly cut stumps to effectively kill the plant preventing future regrowth.

When the top is removed, many trees and shrubs respond by producing new shoots from adventitious buds at or below ground level. These shoots, sometimes called stump sprouts, will regrow vigorously using stored energy from the existing root system. Some stump-sprouting Arizona native species include: oak, ash, aspen, cottonwood, maple/box elder, mesquite, New Mexico locust, sycamore, mountain mahogany, silktassel, willow, and many more. Most native pine, juniper, and cypress species do not resprout (alligator juniper is one exception). In Arizona, stump-sprouting non-native invasive woody plants include: salt cedar, tree of heaven, Russian olive, and Siberian elm.

There are multiple methods that can be used to prevent regrowth of woody plant stumps. The most basic and labor intensive method is hand removal of the stump using a shovel, axe, and/or digging bar. Stump grinders are also available, but work best on relatively open, level sites. Both of these mechanical removal methods are effective on species that do not resprout from large root fragments left in the soil. Mulches (organic and inorganic) are generally ineffective at controlling woody plant sprouts.

General use herbicides can be used to effectively prevent regrowth of unwanted trees and shrubs that resprout after cutting. General use herbicides (over-the-counter products available to homeowners) are not likely to harm the environment when used according to label

directions. These products can be advantageous because the herbicide is translocated to the entire root system therefore preventing regrowth from roots that may be some distance from the cut stump. Remember that all pesticides (including herbicides) should be carefully selected and applied in strict accordance with label directions.

Several stump killing products are available that are applied directly to freshly cut stumps (ready to use) and others require dilution before application. Some common active ingredients in these products are 2, 4-D, dicamba, glyphosate, imazapyr, picloram, and triclopyr. Herbicides containing these active ingredients are available from several manufacturers and carry many different product names. Herbicides containing the active ingredients 2, 4-D, dicamba, and picloram may be subject to "flashback". Flashback is the passive loss of herbicide from treated root following treatment and can result in unintended injury to adjacent vegetation. Read the labels of any product carefully before purchasing to ensure it is labeled for cut stump application and appropriate for the intended use. Once a product is selected, it is recommended that the user buy the smallest container that can complete the treatments for a given situation. Any product stored on the shelf of the garage or shed is a potential hazard and has a finite shelf life.

In Arizona, products containing the active ingredients glyphosate and triclopyr are commonly available to consumers in nurseries and garden centers. Neither of these products is subject to flashback. Glyphosate is known to provide good cut stump control of alder, ash, cottonwood, elm, and Russian olive, but provides only fair control of locust, oak, maple, and willow. Triclopyr is known to provide good cut stump control of alder, ash, cottonwood, elm, locust, oak, maple, and willow, but only provides fair control of Russian olive. These are general guidelines, but may help in selecting the most effective product for a given species.

The above listed products rely on translocation (downward movement of active ingredient) to the root system through phloem tissue (inner bark). This requires they be applied to the freshly cut surface at the proper strength. Unwanted plants should be cut off

close to the ground just prior to treatment. The sooner the herbicide is applied, the more effective the treatment will be. On small stems or on plants that have been cut previously and subsequently resprouted, the bark may be frayed to expose more phloem and potentially increase herbicide uptake. The frayed area should be treated as well as the cut surfaces. Most labels recommend application of the herbicide within five minutes after cutting.

When treating a small number of stumps, the herbicide can be applied with a small, inexpensive paint brush. Pour the necessary amount of herbicide into a disposable plastic cup to prevent sawdust and dirt from contaminating the herbicide in the original container. Triple rinse the paint brush and plastic cup and discard when finished. Applying the herbicide from a plastic spray bottle may be more suitable in situations where multiple treatments are necessary over an extended period. Set the spray bottle to deliver a stream rather than a mist and clearly label the bottle "Herbicide – Do Not Reuse". Test-spray plain water from the bottle to ensure proper function and familiarize yourself with the spray pattern. Completely empty water from the spray bottle and add herbicide when you are ready to begin making applications. Pour the unused herbicide back into its original container when finished. Triple rinse the bottle, spray water to clean the pump then, render the spray bottle unusable (i.e. puncture bottle and cut the pump intake tube) and discard. When working with pesticides, always wear long-sleeve shirt, long pants, closed toe shoes, safety glasses, appropriate gloves, and other recommended personal protective equipment as per product label instructions.



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Plant susceptibility depends on a number of factors: time of year; stage of plant growth; type of application; soil moisture before, during, and after application; precipitation (rain or snow); and temperatures of soil and air before, at and immediately after the application. In general, fall applications are most effective because plants are translocating carbohydrates and proteins to their root systems. Herbicide active ingredients are more readily translocated at this time.

Many woody plants are directly connected to neighboring plants of the same species and herbicide treatments can potentially be translocated to other individuals sharing that common root system. Suckers produced by roots of an adjacent tree are an example of a shared root system. Cutting and treating these sprouts with an herbicide can result in translocation of the active ingredient to the common root system and may ultimately kill non-target trees. In some cases, trees of the same species growing in a given area may have a common root system as a result of root grafting. Never use herbicides to treat sprouts coming off a root system of a tree that you want to keep or on plants that may be sharing a common root system. Sucker producing tree species include: tree of heaven, honey locust, black locust, hackberry, western soapberry, cottonwood, aspen, poplar, willow, box elder, and others.

Always read and follow herbicide label directions carefully. This bulletin suggests ways to avoid problems, but does not supersede product label instructions or cover first aid, or storage and disposal requirements. The herbicide label lists hazards that may make it unsuitable for use in certain situations.

Sustainability— Understanding and Putting It Into Practice

Hardly a week goes by without hearing the words sustainability, sustainable or sustainable development put into use somewhere or somehow. It's no coincidence that the words are often used to describe our lifestyles, future and children's future. This article describes the origins of "sustainability" and the areas of our lives where we can put the word into practice.

First, let's take a look at a basic understanding of the word's meaning and a little history into its emergence. The adjective "sustainable" means: "a: of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged, b: of or relating to a lifestyle involving the use of sustainable methods." (Merriam-Webster's On-line Dictionary)

In 1987, the United Nations' World Commission on Environment and Development issued a report titled Our Common Future also known as The Brundtland Report, named for the Commission's chairwoman, Madame Gro Harlem Brundtland, who was the Prime Minister of Norway between the years 1981-1996. This report defined sustainable development as:



“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”
(Brundtland, 1987)

In 1991, three environmental organizations, the International Union for Conservation of Nature and Natural Resources (IUCN), the United Nations Environment Programme (UNEP) and the World Wide Fund for Nature (now the World Wildlife Fund), and the author David Munro, jointly published a book called *Caring for the Earth*. This book contributed substantively to the concept of sustainable development by offering some very basic principles and ideas. Underlying these principles is the following premise:

“We need development that is both people-centered, concentrating on improving the human condition, and conservation-based, maintaining the variety and productivity of nature. We have to stop talking about conservation and development as if they were in opposition, and recognize that they are essential parts of one indispensable process.” (IUCN et al., 1991)

The National Network of Sustainable Living Educators (NNSLE), made up of university Extension agents and other sustainability professionals from across the country recently released a white paper titled *A Vision for Relevance* (Crosby et al., 2008). This paper describes the imperative for individuals and communities to be engaged in the issue of sustainability.

The NNSLE defines three critical components of sustainability—economic, social and environmental. *Economic* sustainability is defined as maintaining or increasing our standard of living without decreasing the standard of living of others. *Social* sustainability implies equity and fairness in the creation of vibrant community life, both locally and globally. And lastly, *environmental* sustainability mandates conserving and managing our ecosystems for future generations. Any sustainability solution must consider all three of these components. If not, then that solution is bound to have a negative impact on the one component that is overlooked.

So what are the areas of our lives where sustainability matters? As we consider the economic, social and environmental components of sustainability, then land use, construction, energy, food, consumerism, health, economic development, employment and education are all areas needing to be addressed either through individual choices or community initiatives.

Rural residents tend to lean towards rugged individualism. Self-sufficiency can easily be equated with sustainability, where growing your own food, raising your own poultry and livestock, and harvesting rainwater are all measures that conserve resources. These practices are not necessarily innovative or new, but have actually been around for thousands of years.

Today, the creed of self-sufficiency has plenty of room to expand into modern concepts of sustainability that further decrease our dependency on finite resources. For example, “living off the grid” in contemporary terms no longer means relying on fossil fuels to power generators. Instead, renewable resources such as solar technology and wind turbines are becoming more affordable and provide a new pathway to sustainability in the rural areas. The same holds true for the potential of second generation cellulosic biomass fuels as a substitute for gas and diesel-powered machinery (Huber and Dale, 2009).

In those rural areas where residents already have access to the grid, solar technology and wind turbines are still viable, renewable energy sources that not only reduce an individual’s consumption of fossil fuel based energy, but can also potentially contribute to the grid, through net-metering. Utility companies in Arizona are now offering rebates to individual consumers for certified solar installations. These along with net metering agreements with utility companies can go a long way to recovering the cost of the installation. In addition, thirty percent of residential solar installation costs can be deducted directly from income taxes owed to the federal government, since Congress extended the Solar Investment Tax Credit in 2008.

Farmers markets are an integral part of the urban/farm linkage and have continued to rise in popularity, mostly due to the growing consumer interest in obtaining fresh products directly from the farm. Farmers markets allow consumers to have access to locally grown,

farm fresh produce, enables farmers the opportunity to develop a personal relationship with their customers, and cultivate consumer loyalty with the farmers who grows the produce.

Local farmers' markets can also be a vehicle to enhance the sustainability of rural areas. Farmers' markets return a higher percentage of our food expenditures to the local economy than buying from retail outlets that source abroad. Decreasing the distance that our food travels can reduce greenhouse gases generated from fossil-fuel driven transportation. Communities benefit from an abundance of fresh and nutritious fruits and vegetables which promote healthy individuals and keeps health care costs down. Arizona residents can locate farmers' markets, agri-tourism events, and other producers that sell directly to consumers by going to www.farmdirectory.org. This resource, developed by the University of Arizona's Department of Agricultural and Resource Economics, can display the local produce available by week of the year for a maximum distance from a specified zip code.

places that rural residents drop off their normal garbage. The Arizona Department of Environmental Quality has a website (www.azrecycles.gov) that allows anyone to find the closest recycling facility to them by just plugging in their zip code.

It's easy to feel overwhelmed by the continuous stream of information and media coverage about environmental degradation, depletion of natural resources like water and agricultural lands, the effects of climate change including drought and invasive species, and the very tangible outcomes of global economic crises. One could be led to believe that there is very little that any one individual or small rural community could do to make a difference or stem the tide of negative impacts. Yet, understanding and acting upon the concept of sustainability as individuals and communities is a major step forward. As illustrated in this article, there are numerous ways in which we all can make a difference—for the sake of the planet and those following in our footsteps.



Producers that choose natural or organic agricultural practices are reducing the amount of energy inputs associated with chemical pesticides and fertilizers. Appropriately managed range and farmlands are a sustainable asset to our watersheds by conserving soils, enhancing wildlife habitat and providing open space and recreational areas. Agricultural tourism is an excellent example of the convergence of the economic, social and environmental components of sustainability.

In the arid Southwest, water has always been a precious resource and our growing population has heightened the scarcity of this resource. The certainty and frequency of drought in the Southwest make it even more important for us to use our water resources in a more sustainable fashion. Arizona Cooperative Extension has a multitude of informational resources on reducing our water consumption—through low-flow appliances, drought-tolerant landscaping, rainwater harvesting and simple practices in the home and garden (www.ag.arizona.edu/extension/water).

Many have heard the popular mantra of “reduce, reuse and recycle.” This description of the waste hierarchy has been a powerful tool for many years to raise our collective conscious about the trash we produce. It serves us well, too, as an apt slogan for sustainability. Although recycling facilities may be located a good distance away in rural areas, many counties and communities are now providing recycling drop-off containers for aluminum and tin cans, office paper, cardboard, newspaper and #1, #2 and #3 plastics, tires, hazardous waste, and batteries at various locations and sometimes at the same

Sources of Information:

- www.ag.arizona.edu/extension/water
- www.azrecycles.gov
- www.farmdirectory.org
- www.usda.gov/oce/sustainable/
- www.sustainable.org

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Colic—the most common and often serious health problem faced by horse owners. In a 1999 national study by the United States Department of Agriculture, National Animal Health Monitoring System (NAHMS), it was estimated there were 4.2 colic events for every 100 horses. Of these colic events 11.0% were fatal to the horse! In 1999, colic treatment and losses cost horse owners over \$115 million. Often horse owners find themselves dealing with a serious and expensive health problem and they don't understand the underlying causes of colic.

Colic is really not a specific disease but a term that is used to describe a clinical sign, a symptom. The onset of colic signs are usually the result of a disease process taking place in the digestive system of the horse. What usually happens is a section of GI tract becomes distended, the wall of the bowl stretches,

and the stretching causes pain. The horse responds to this abdominal pain with the common early signs of colic: playing with water, refusing to eat, looking at or biting flanks. If the underlying cause of distension is not relieved, the colic signs become worse, the horse will kick at their belly, get up and down and roll, or have a saw horse position (hind legs stretched out as if trying to pass urine). In very serious colic the horse will start to go into shock, the pulse rate will increase, the gums become very dark and the skin becomes dehydrated. If the shock becomes worse or if the digestive tract ruptures the horse will become very pained and is euthanized or dies. Horses tend to have more problems with colic that other species. This is due to

the design of their digestive tract. For example: horses cannot vomit or regurgitate due to the shape of their stomach. Most of the fiber digestion takes place in the cecum and large intestine; all together these organs are 29 feet long and hold 130 quarts in the mature horse. Also, horses seem to have a lower tolerance to pain than cattle or dogs and cats.

What are the common disease problems found in the digestive tract that lead to the onset of colic signs? All of these will cause distension of the GI tract and colic pain.

Spasmodic This is the most common and is often seen with weather or feed changes. Parts of the GI tract go into a spasm (like muscle cramps) causing pain. This type of colic often responds well to simple medical treatment

Impaction This is the blockage of the GI tract by food. Impaction will respond to treatment unless the blockage is extensive, then surgery is required

Ileus This is a term describing the GI tract (usually the small intestine) when it simply stops moving food along the tract. This is usually the result from damage the blood supply to the small intestine from the migration of small strongyles. If a large section of the intestine is damaged, surgery is required.

Obstructive masses These are masses that can block the tract. They include parasites (bots, roundworms, and tapeworms), foreign material (hay

string, plastic bags), sand (common in Arizona) and enteroliths. Enteroliths look like smooth river stones and are formed in the large intestine of horses.

Displacement Part of the GI tract is trapped or twisted, the affected area will lose blood supply and die, surgery is required!

Fermentation Excessive gas is produced causing distension. This usually happens in the stomach or large intestine. If the production of gas can be decreased and the trapped gas moved out, surgery is not required.

With so many possible causes of colic, it is difficult for horse owners to know if they are dealing with a simple spasmodic colic, or are seeing the early signs of a life-threatening problem for their horse. What you should do at the first sign of colic is to remove all feed and water. If the horse is

trying to roll, walk the horse; if the horse is quiet allow them to stand and watch. Watch for the horses' general attitude and degree of pain and check the heart rate. If the pain is getting worse or if the horse has an elevated heart rate (normal is <50 beats/minute, moderate colic is 75-80 bpm, severe colic is > 100 bpm). At any indication of the colic getting worse, veterinary care should be called as soon as possible.

As treatment for colic can be very expensive, horse owners should do as much as possible to prevent colic. The American Association of Equine Practitioners (AAEP) has developed 10 tips for prevention of colic. Following these guidelines will not prevent all colic cases, but should reduce the chance of your horse developing colic.



S Peder Cuneo

Colic in the Horse

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Ten Tips for Colic Prevention

1. Establish a daily routine of feeding and exercise, and keep to it.
2. Feed a high quality diet that is high in roughage, although finding something other than alfalfa hay can be a problem in Arizona.
3. Avoid feeding excessive grain and/or energy dense supplements. A good guideline is that roughages should provide twice as much of the diet energy as concentrates.
4. Try to feed hay free choice and limit concentrate to two or more smaller feedings. Avoid one single large feeding.
5. Implement a regular parasite control program.
6. Daily exercise or turnout. Any change in intensity or duration of exercise should be gradual.
7. Provide fresh clean water at all times, BUT do not over water excessively hot horses.
8. Don't feed on the ground!
9. Check hay, bedding and pasture for possible toxicities such as blister beetles, noxious weeds and foreign matter.
10. Reduce stress. Horses in high stress such as changes in workloads, environment, transport or shows are at risk for developing colic.

Fireplace Safety

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When wood burns, the fire goes through three stages. In the first stage (up to around 500 degrees F), the heat of the fire simply dries the wood. In the second stage (500 to 1100 degrees F), sometimes referred to as pyrolysis, the wood breaks down chemically, emitting flammable gases that contain more than half of the heat energy of the wood. In the third stage (over about 1100 degrees F), the gases and remaining charcoal burn.

Just for fun, if you watch a log burn in an open fireplace, you might catch a glimpse of a jet of hot gases blowing out the end of a log. You may actually see that the gases are escaping from the log, but not igniting until the jet of gas is a measurable distance away from the surface of the wood.

Problems develop when the flammable gases enter the chimney or vent pipe before they have burned. As the gases cool below 250 degrees, they condense as acids on the inside of the chimney. As they dry and coagulate, the acids thicken into a highly flammable, tar-like substance called creosote.

Because the creosote formation is caused by cooling the unburned gases, anything that leads to incomplete combustion or cool chimney temperatures will increase the problem. Wet wood uses more of the fire's heat to evaporate water and reduces the exhaust gas temperature. Restricting the combustion air to the fire slows the burning rate and leads to incomplete combustion and lower temperatures. Even using heat exchangers to capture more chimney heat will lead to cooler chimney temperatures and more creosote formation.

Slow burning fires and efficient heat transfer to the room would seem to be desirable situations. However, the risk associated with creosote formation is that if the chimney gets hot enough, the creosote will ignite, causing a chimney fire.

Chimney fires are easily identified. You may first hear a "crackling" in the chimney. If enough creosote fuel is present, the crackling may develop into a roar. The chimney will become extremely hot. Metal vents may actually glow red or orange. The chimney may become hot enough to ignite nearby building materials and start a house fire. Flames and sparks shooting out the top of the chimney may cause a fire on the house roof or on surrounding buildings. The chimney liner may be cracked or warped by the hot fire, making the chimney unsafe for future use.

You can avoid chimney fires by preventing creosote build-up in your chimney. Here are some pointers:

- Season wood properly before burning. Wet, unseasoned wood causes more creosote than dry wood. Dry pine is also more likely to create creosote build-up than oak and juniper.
- Avoid long, slow-burning fires. Restricting the fresh air supply causes incomplete combustion and more creosote build-up in the chimney.

- Allow frequent hot fires. A brief hot fire every day or two can help remove small creosote deposits.
- Check your chimney monthly. Clean your chimney with a stiff wire chimney brush annually, or before the creosote reaches a thickness of one-eighth inch.
- Use a catalytic stove that allows the volatile gases to burn at a much lower temperature, greatly reducing wood smoke and creosote, and also increasing heat output by 25 to 30 percent. These catalytic combustors can be purchased in new stoves or can be added to existing stoves. They generally add around \$200 to the cost of a stove and must be replaced every several years.

If a chimney fire does happen, take these steps:

1. Call the fire department and evacuate the house.
2. Close all air inlets but leave the damper open to avoid pushing the fire into the interior of the home.
3. Discharge a UL listed fire extinguisher into the stove.
4. Wet the roof and watch for outside fires caused by sparks.
5. Have your chimney inspected before putting it back into service.

Chimney fires are a real and dangerous possibility when heating with wood. A 1982 study by the U.S. Consumer Product Safety Commission reported that wood-burning appliance fires accounted for 20 percent of all residential fires and 5 percent of all fire deaths. While most chimney fires are confined to the chimney itself, the intense heat sometimes ignites surrounding building materials and furnishings.

While we're talking safety, let's not forget disposal of ashes. Ashes must be stored in a metal container with a tight lid. The closed container should be placed on a non-combustible floor or on the ground well away from all combustible materials. Wood ashes do contain small amounts of phosphorus and potassium, essential plant nutrients. However, wood ashes are also very alkaline. Adding large amounts of ashes to the soil can raise pH to undesirable levels and cause plant growth problems. Before you add ashes to your garden, test the pH of your soil. If the pH is above 7.5, don't add ashes. If you do add ashes, spread them uniformly at no more than 15 pounds per 1000 square feet. If you are unsure about using ashes on your garden, check with your local Cooperative Extension office.

Careful operation and maintenance can help minimize the risk of accidental chimney fires. For more information on chimney installation and maintenance, talk to your local fire department, building inspector, or home insurance carrier.

The Buzz About Pollinator Gardening

Stacey Bealmeear, Extension Agent, Urban Horticulture, University of Arizona Cooperative Extension, Yuma County



Stacey Bealmeear

Honeybee cleaning nectar off its face after pollinating a Yellow Bell (*Tecoma stans*) flower.

Pollinator gardening has become a popular pastime for many gardeners. Incorporating pollinator gardening into a normal vegetable and flower garden is not only simple but can be fun and beneficial. It can increase fruit and vegetable yield in addition to the reward of attracting and observing wildlife. Many gardeners keep pollinator sighting lists and proudly compare these with friends.

Pollinators are animals that move pollen from flower to flower. This is important because without the movement of pollen, reproduction could not occur. Pollen is moved from the male part of the flower (anther) to the female part of the flower (stigma). Animals do not consciously pollinate, they visit flowers looking for nectar and transfer pollen stuck to their bodies as they move from flower to flower. Many insects also consume pollen. This relationship has evolved over 144 million years and most plants need to be pollinated to produce flowers, fruits and seeds (Buchmann and Nabhan 1996). Animal pollinators include bees, butterflies, moths, flies, beetles, bats and birds. In other countries, animals such as monkeys and rodents can even serve as pollinators. One third of human food crops such as cucumber, melons, tomatoes, almonds, onions and strawberries are pollinated by animals. Thanks to pollinators, 10 billion dollars in crops are produced in the US every year (Watanabe 1994). They are also responsible for 60-80 percent of the

pollination in non-food flowering plants such as wildflowers and native trees (Black et al 2007).

There has been a severe decline in both native and managed pollinator numbers. Honeybee colony populations have dropped by fifty percent since 1945 (Mader 2009). This is due to many factors including disease, loss of habitat, decreased food quality and pesticide use. Pollinator gardens provide a variety of components to make a complete pollinator habitat to increase pollinator populations. Replicated in yards across the county these gardens can provide necessary nectar corridors in what are otherwise fragmented landscapes. You don't need a large amount of space to have a pollinator garden. Even people living in apartments can have one. First, start with an inventory of the plants you have and who is visiting them. Then decide which pollinators you would like to attract and plant the flowers that will bring them. When selecting plants choose a variety of flower shapes, sizes and colors because the larger the diversity of plants the larger the diversity of pollinators you will attract. It's also important to have plants that bloom through the year so that pollinators always have something to eat. Ideally you want at least three different plants in bloom during each season. Choosing native plants is ideal because native pollinators are adapted to them and the plants are adapted to the native soil,



Stacey Bealmeier

Fritillary butterfly caterpillar on Passion Vine (*Passiflora vitifolia*).

moisture and temperature conditions. Native plants may provide more nectar than many ornamentals that have been bred for color or style. Heirloom plants and herbs can also provide large amounts of nectar. Remember that native plants take a few years to get established so be patient. If you're not going to use native plants make sure to select plants that work well in your hardiness zone. Plant flowers in clumps so they are more easily found.

To provide a complete habitat your yard should also include an area for pollinators to rest and get water, as well as nesting sites. Bird baths, fountains or dripping irrigation lines that flow into shallow dishes are great options for resting/watering sites. Nesting sites are just as easy; many bees and wasps nest in bare soil so leave open ground for them. Beetles nest in twigs and dead branches and their homes can eventually be converted by some solitary bees into nesting sites. Bee houses can also be used to attract solitary bees if you do not want to leave twigs and branches around. They are simple to make and can be fun projects to do with children. Other pollinators can use upside down flower pots and piles of stones to nest in. Piles of small twigs and string can encourage nesting birds.

While providing habitat for pollinators it is important to minimize or avoid pesticides in your yard. Insect pollinators are very susceptible to pesticides. Recovery after pesticide application is slower because they reproduce more gradually than pest insects. If you must use pesticides try less persistent products and always make sure to follow label instructions. Another option is to spray at night since many pollinators are daytime fliers. But watch out for night pollinators like moths. Buffer zones between sprayed areas and where pollinators visit can help protect them and never spray during windy conditions where chemicals can drift.

Plants pollinators and the flowers they enjoy:

Bats enjoy large (1-3.5 inch) bowl shaped flowers with light colored petals and lots of fruity smelling nectar. Since bats are night time fliers they pollinate flowers that open at night. Many of the plants they pollinate in Arizona are night blooming cactus. They also feed on insects found in the flowers.

Bees have different vision than humans; they only see reflected light from yellow-green, blue-green, blue-violet flowers and ultraviolet light. The color red is not visible in their spectrum at all. This special vision helps them to see what is sometimes termed landing patterns or nectar guides. Series of lines and dots help bees zero in on nectar. For this reason bees are most attracted to light colored flowers. Bees enjoy tubular shape flowers with a light sweet smelling with nectar located in the back of the flower tube like the flowers of the Desert Willow.

Many people are scared to attract bees into their yard for fear of being stung. While this is a possibility, it is not likely. Bees are not out to sting humans because once they do they die. Instead they enjoy browsing from flower to flower and staying to themselves. The majority of native bees are solitary and do not have a hive to protect which makes them even less likely to sting.

Beetles are attracted to bowl shaped, wide open flowers, such as asters. These are usually dull white and green flowers ranging from no fragrance to a strong fruity smell.

Butterflies with their long mouthparts enjoy flowers with flat tops or clustered tubes. They are attracted to red, yellow, orange, pink and purple blossoms. Feeding occurs on flowers in full sun not shade. These pollinators also enjoy fruit, so place overripe bananas, oranges and other fruits in a dish in your garden. The most important thing to remember is that in order to get butterflies you have to have caterpillars.

Make room for them by allowing them to eat leaves and stems. Don't worry, most caterpillars will not kill your plants. As mentioned earlier, butterflies need water. Puddling is a common way for butterflies to drink and also get needed minerals. To simulate a mud puddle in your garden place sand in a shallow dish on the ground with a drip emitter that will keep the dish full of water. You can also provide a sponge soaked in lightly salted water which provides needed micronutrients. Sea salt is better than table salt because it provides more nutrients.

Flies have short mouthparts and are attracted to flowers with a simple bowl shape. Many times nectar on these flowers is exposed. Fly pollinated flowers can have a sweet smell but many smell like decaying organic matter. They like flowers in shades of green, white, and cream.

Hummingbirds are attracted to brightly colored (red, orange, yellow) trumpet shaped flowers with lots of nectar. The flowers are odorless and open during the day. You can also put out hummingbird feeders with syrup made of one part white cane sugar and four parts water. It is not necessary to add red food coloring. Make sure that in extreme heat the solution is changed and feeders are cleaned regularly to avoid sickness in the birds.

Moths, like their relatives the butterflies, have long mouthparts they use to drink nectar from flowers with long tubes. Most are nighttime

fliers and are attracted to white or light colored flowers that are visible at night. Many of these night blooming plants have a very sweet smell.

For more information on which plants to pick visit the following sites:

<http://www.wildflower.org/plants/>

<http://pollinator.org/pdfs/AmericanSemiDesert.rx8.pdf>

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Chuparosa (*Justicia californica*) is a favorite for many pollinators including hummingbirds.

Stacey Bealmear



Arizona's Conservation Districts:

A Long History of Locally Led Landowner Conservation

Stefanie Smallhouse, Executive Director, Arizona Natural Resource Conservation Districts State Association

Going Green is the catch phrase for this next generation. Our kids today are learning about recycling, water conservation, carbon emissions, and solar energy as part of a core curriculum. However, natural resource conservation has been a factor in the lives of America's farmers and ranchers for decades; In Arizona, over 67 years to be exact. But, to appreciate where we are, we must be aware of our past.

April 14, 1935 marked the culmination of the period known as "The Dust Bowl." Black Sunday will be known forever in our history as the day of the worst dust storm ever recorded. For ten years, the dust blew over the barren, drought stricken grasslands of the Great Plains. There were no native grasses or crops to hold down the soil and the irrigation

that we use today to water crops had yet to be developed. Farming and ranching families were literally living through a hell on earth. Between the suffering of the Great Depression and the choking dust that killed and entered every crack in their lives these people refused to give up. Luckily, over 80% of them stayed in the area hoping for rain, fields of green, and clean air.

This was our country's worst ecological disaster in history. By 1937 more than three-fourths of the topsoil had been lost from 8,543,000 acres. It was that same Sunday storm in 1935 that left a layer of Panhandle dust across the desk of President Franklin D. Roosevelt. Up until that time the rest of the country, to include our lawmakers and President, were totally preoccupied with the economic crash and had little sympathy or understanding of what was happening to the west of the Mississippi. Shortly thereafter, Congress unanimously passed legislation declaring soil and water conservation a national policy and priority. It was a defining moment in time when America's government and its farmers realized that food production and westward settlement could not take place at the expense of our most valuable resources.

President Roosevelt created the Soil Conservation Service (USDA, renamed in 1994 to Natural Resource Conservation Service), a federal agency, to disburse program funding and provide technical assistance to farmers. This enabled immediate projects that with the help of rain ended the enormous loss of America's soil and forever changed cultivation practices for the better.

The President also requested of all the states that they enact legislation allowing local landowners to form Soil Conservation Districts to work closely with the NRCS and bridge the gap of mistrust that had developed over the past decade between the farmer and the Federal Government. This was necessary because nearly three fourth's of the U.S. was privately owned and Congress realized that only active, voluntary support from landowners would ensure that conservation of our natural resources would be successful. There is no other landowner/federal agency partnership in existence that works so effectively. Over the decades Conservation Districts have served as the vehicle for local leadership, landowner empowerment, and generations of stewardship knowledge, while partnering with the NRCS to turn federal dollars and programs into actual on the ground conservation.

Arizona's Soil Conservation District enabling act was passed in 1941. At that time only croplands were included but by 1954 all lands were included in the enabling act. Arizona has 41 Conservation Districts blanketing the entire state. The majority of the Districts encompass rural areas and now go by the name Natural Resource Conservation Districts (NRCD), still focusing on conservation practices for agricultural lands. These districts are legal sub-divisions of state government and are governed by locally elected landowners who serve as Supervisors and continue to manage districts for their original intent: "to provide for the restoration and conservation of lands and soil resources of the state, the preservation of water rights and the control and prevention of soil erosion, and thereby to conserve natural resources, conserve wildlife, protect the tax base..." (ARS Title 37, Chapter 6). Supervisors are able to do this through determining the resource conservation needs of the District, developing and coordinating long-range plans and programs of natural resource conservation, and implementing them under the District's annual plan of operations.

Conservation Districts facilitate disbursement of federal conservation program funding through education, technical assistance, and funding/project prioritization. These voluntary landowner driven conservation efforts also include working with all entities, government or private, responsible for natural resources management. District activities

include, but are not limited to: flood control projects, rangeland monitoring assistance, watershed assessments, wildlife habitat improvement projects and education, irrigation management, alternative energy education and assistance, archaeological site preservation, and conservation education workshops for producers. Conservation Districts also manage Environmental Education Centers that focus on straight forward science based environmental education for adults and children. Their work also incorporates how conservation plays an important role in agriculture and the way that our food and fiber is produced.

Conservation at this level is vital as the farmers and ranchers managing the land surrounding Arizona's urban areas ensure that water comes out of the tap and food is on the dinner table. However, today there are more homes than farm fields and livestock pastures in many districts. This requires that Conservation Districts consider conservation planning, priorities, and education for the needs of residential landowners as well.

If you are not currently involved with your Conservation District and would like to be, or need information regarding a natural resource issue please consider contacting a Supervisor from your District. District meetings are open to the public and agendas are posted at

least 24 hours in advance of the meeting in a designated location. To find contact information for your district go to the Arizona State Land Department's website www.land.state.az.us and click on "Directory of Supervisors" located under the Natural Resources Tab: Conservation Districts. For information regarding the Tribal Soil and Water Conservation Districts contact Stefanie Smallhouse, Executive Director for the Arizona Natural Resource Conservation Districts State Association @ 520-850-8250.

Since 1935 we have made great strides in land and water management through conservation minded actions. We have not experienced a natural resource disaster like that of the "Dirty Thirties" since the creation of the Conservation Districts and the invaluable Natural Resource Conservation Service. The most successful conservation efforts in our Country's history have been led and carried out through the voluntary, self-motivated actions of those that live close to the land. This is the tradition established by Conservation Districts. Consider being a part of it!

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