



Pinal County Cooperative Extension Garden & Landscape Newsletter September 2007



PLANNING A DRIP IRRIGATION SYSTEM

No, no, no! Just because we have seen a little more water fall from the skies this monsoon season does not mean that the drought is over!

With the increased precipitation that has come this summer, there seems to be a relaxing somewhat in the concern about water supplies in our desert. Please do not make the mistake of thinking that we are out of the woods. Weather data and long term climate patterns indicate that our enthusiasm may be premature.

Climatologists are telling us that the normal variation in precipitation can be as large as two to three inches each year in any given site. So, the rain that we have seen this year throughout Pinal County should still be seen as “normal”. Additionally, we must remember that, just as easily, we could flip right back into a devastating dry spell. Most of those in the know are expecting it.

Looking at the state as a whole, most of the rain that has fallen has come to the central and southeastern part of the state this year. Some sites like Payson, Flagstaff and Prescott seem to be running at, or below, normal this year. Next year, they could have the extra rain and we may be dry. The point is that we must remain on our guard and not let our perceptions get ahead of reality. In the desert, every single drop of water is important and we should be good stewards of every drop that we use.

—Planning a Drip Irrigation System, Page 2

DATE PALMS

Don't have room in your yard for a citrus tree but need something to satisfy that sweet tooth? Consider planting a date palm.

When we think of fruit trees for the home yard, most people think of citrus, apples, peaches or apricots. Okay, I'll buy that. They are important and popular fruit trees, but let's not get in a rut, shall we? Let's think outside of the box.

The date palm is ideal for our desert conditions because it uses little water, fits into tight spaces, requires only a minimum of work, gives wonderful, sweet tasting fruit and rarely gives problems. I'd like to see more people give serious consideration to planting date palms as part of their home landscaping plan.

Dates have long been an important food source in the desert regions of North Africa and Southwest Asia. In America, dates were first produced from seed imported by Jesuit Missionaries. The first commercial date garden was planted in 1912 and between 1920 and 1945 about five hundred acres of commercial date palms were grown in Arizona. Summer rain fall proved a serious hazard, however, to commercial production in the Salt River Valley and most of the palms have since been destroyed.

Although commercially unprofitable in Arizona, date palms can provide adequate production for home use. There are three types of dates grown in the home yard. Soft dates have soft flesh, high moisture content, low sugar, and are highly perishable. Semi-dry varieties have firm flesh, low moisture content, high sugar content and may be kept for weeks or months at room temperature with little deterioration. Dry dates have a high sugar content but are undesirable for fresh consumption because of their hard, dry flesh. The most popular varieties in our area include: Halawy, Hayany, Khadrany, Khustany, Matoom, Medjool and Zahid. The first five are soft date varieties and the last two are semi-dry. Date aficionados almost always give highest ratings to the Medjool for taste and texture.

Date palms are dioecious, that is, each tree is specifically male or female. To get dates, you have to have a female tree whose flowers are pollinated by a male tree. When you plant a date palm from seed, you simply will not know what sex of tree you have until it begins to flower. That is why most people select a potted plant of known sex

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In the garden or landscape, a serviceable drip irrigation system, properly designed, assembled and managed, is a wonderful tool to help conserve this valuable resource.

Tailor-made for desert living, drip irrigation saves work, as well as water, and is economical and easy to use. The idea isn't new, but bolstering a rising interest in this irrigation technology are the steady improvement and convenience of today's systems, backed by the reality of the limited supply and rising cost of water.

There are many different variations of drip systems now operating throughout the area. Generally, the systems focus on drip, trickle, or ooze types of delivery, but can also include misting, spraying and sprinkling. Many stores carry a wide variety of components to design and assemble whatever kind of system that meets your particular situation.

Most systems consist of three main parts: basic controls, polyethylene hose and emitters. Emitters are connected by polyethylene tubing to a main water supply line and direct a controlled quantity of water to the soil.

The basic controls include the shutoff valve, pressure regulator and filter. A manual on-off valve is usually combined with the anti-siphon valve required by public health codes.

A pressure regulator reduces the water pressure from the 50 to 90 pounds per square inch (psi) in most household water lines to the low 5 to 30 psi needed for most drip systems. It also helps to keep the pressure constant in the system when normal fluctuations occur in outside water lines. This will assure a measured flow of water through the emitters.

The filter screens out sediment, undissolved salts and other particles in the water that could plug small openings in the emitter. Filters come in different shapes and capacities. Two common kinds are the inexpensive cylindrical filter and a larger Y-shaped style that is easier to flush and clean.

Because a drip system turns on and off frequently, an automatic timer eliminates the hassle of having to remember to personally twist the handle. With an adapter that connects to an electric time clock, you can easily convert a manual valve to automatic. Timers can be hooked directly to the household electric current or can be battery or solar powered. The timer can save a lot of extra work and help ensure that all plants get the water they need, when they need it.

Polyethylene hose carries water from the source to the point where it will be delivered to the plant. The newer styles of hose are quite flexible and strong. This gives considerable flexibility in designing and installing a system that is right for you. Sections are joined by fittings that require no cement or special tools.

Small-bore polyethylene tubing is called micro-spaghetti, transfer or extension tubing and are typically

one-eighth to one-fourth inch in diameter. Tubing of this size is used to divert water from the larger laterals.

Emitters come in many shapes and sizes with various internal mechanisms. All have the responsibility to slow the flow of water from the line and dispense it drop by drop to the soil. Emitters have rated capacities set by the manufacturers, which means that at specified operating pressures, they deliver specific amounts of water per hour.

For most purposes, a regular, non-pressure-compensating emitter is simple, reliable and inexpensive. These will usually be the workhorses that will be used throughout the system. Other specialty emitters can be used for specific purposes.

Assembling a drip system is fairly easy, and seldom takes for than a few hours. It is always a good idea to start with a fairly detailed plan, one that will give you a detailed shopping list.

On grid paper, draw the house and garden with a scale of 1 inch to 8 to 10 feet. Locate buildings, walkways, patios, faucets and the kinds and sizes of plant that will need to receive attention. Mark any slopes with a downward arrow and note elevation changes. Also note what kind of soil you have. Is it a porous, sandy soil, a medium-textured loam or a moisture-holding clay?

On the drawing, sketch where the drip lines will run. Use this to assemble a parts list of fittings, emitters, hose and basic controls. When you have everything together, it is time to assemble the system. Most stores selling drip irrigation equipment have knowledgeable people on staff who can help ensure that you have what you need. They will also show you how to assemble the system.

May I make one final, critical suggestion. Be sure that the size of the system matches the volume of water available so that the pressure, and water flows, will remain constant between the front and the end of the system. The basic rule of thumb here to remember is that the longer the tube, the more the pressure drops off. A strong flow from an emitter at the head of the line may turn into a tiny drip at the lower end, if the total length of the drip line is too long.

Estimate your capacity for pressure loss by measuring your water flow. Capture the volume of water that flows from the faucet in one minute's time into a bucket. Measure the volume of water in the bucket in gallons. With this gallons-per-minute measurement, most stores will be able to help you decide the system size that is right for you.

Correctly installed, drip irrigation is an easy way to water garden and landscape plants efficiently; but a good system must be properly designed, assembled and managed. A little planning and careful attention to detail will make possible the installation of a good, serviceable drip irrigation system.

DATE PALMS, Continued from Page 1

so that they do not waste any time getting the tree into production. We frequently get questions from would-be date growers wondering why their trees do not produce dates. Unfortunately, the most frequent reason is that they have a male tree. So make sure of the sex of the tree before you purchase and plant.

Once you are sure that you have a female tree, it is essential that the flowers receive pollen from a male tree. This then means hand pollination is usually necessary to insure a good fruit set, especially if there is not a male tree in the near vicinity. Some growers, who have room in their yards, plant one or more of each sex. If you only have room for one tree, you will have to hand pollinate.

If you do not have a male tree close by for normal wind pollination, you will need to find an external source of pollen. Sometimes you can purchase pollen, but you will have to look for a source. I do not currently know of any source of local pollen for sale. The better course, I think, is to work out a deal with a male tree owner. For sharing pollen with you, they get a share of the dates. Be innovative, I am sure you can work it out.

Male flowers for hand pollination should be collected within a few hours after the sheath of the male flower structure splits open. This will prevent pollen loss. The pollen bearing structure should be stored in a cool place until the female flowers, (they are really called florets), on the female tree are ready for pollination. Three or four strands of the male flower should be placed with the female strand from one to three days after the female sheath splits open. The pollen-bearing male florets may be held in place by tying them to the female flower with twine. Use a slip knot so that the binding can gradually be loosened as fruit development proceeds.

Once the florets are pollinated, fruit development will begin. Thinning of the fruit will be important. Date palms tend to produce more fruit than they can effectively support, which steals strength from the tree. This can cause fewer flowers and less yield the following year. An average palm tree with one-hundred leaves can easily support seven to eight fruit clusters. If you have less leaves, some clusters will have to be thinned out. I'd start with the smallest clusters first. It will also be important to thin out some of the developing dates within the clusters to make sure that there is plenty of room for the remaining dates to size correctly.

This is best done when the developing berries reach one-fourth to one-half inch in diameter. Remove one or two fruit strands from the center of the cluster and then remove a few individual berries from the remaining strands to give the remaining dates sufficient space to grow.

To prevent wind damage to fruit and the breaking of long fruited arms, support the weight of the heavy clusters by tying each one to an adjacent leaf midrib. Rain and high humidity may cause physical damage to the fruit in



The Medjool Date Palm Tree

the period preceding ripening. When this happens, cracks appear in the fruit surface through which fungi and bacteria may enter. Fermentation or souring of the fruit rapidly follows.

Fruit clusters can be protected from damage by covering them with commercially available date covers. These heavy waxed, rippled bags are placed around the clusters and tied tightly to the fruiting arms just before the fruit begins to ripen. It is important to cut off any excess length so that no more than three to four inches of the bottom of the cluster is exposed. It is advisable to raise the covers, temporarily, soon after a rain to allow free air to circulate.

A satisfactory substitute to commercial bags is commercial butcher paper. Remember to use a slip knot so that you can loosen the binding as the fruiting structure swells in size.

Once the fruit begins to ripen it will be necessary to make several pickings so that all the fruit can be saved from damage from insects and micro-organisms. Since all fruit does not ripen at the same time, be ready to pick off individual dates as they reach the correct stage.

Dates should be picked when they are only partially ripened. The beginning of ripening is marked by the appearance of translucent spots on the skin at or near the fruit tips and gradually spreading over the entire fruit surface. At this stage, the flesh is still firm, but as ripening proceeds, it becomes soft and mushy. For home processing, it is best to wait until the fruit is fully translucent and sweet to the taste before picking. Damaged, sour, and fermented fruit attract insects and should be selectively removed from the clusters at each picking.

The fruit should be sorted very carefully and all soured and fermented dates should be discarded. Soft dates should never be washed directly in water. A convenient method to clean small lots is to spread the fruit on the surface of a moist towel held on a tray. Gently shake, roll and tumble the fruit to remove adhering soil and debris. The towel should be frequently rinsed in clean water.

Dates picked before they are fully ripe can be completely ripened by heating at a temperature between 95° and 100° Fahrenheit. Heating is continued until the fruit is cured to the point where spoilage will not occur. Tree ripened fruit need not be cured.

MOSQUITOES

Do you hear whining, high-pitched noises in your ear as you walk outside? Do your children have large, red welts on their skin when they come inside after play time? If so, you may have a mosquito problem.

The summer rains have produced a bumper crop of mosquitoes this year, particularly in the Maricopa area. Standing water has proven a haven for mosquitoes and their larvae and large populations have made life miserable for many people. From the questions and complaints, it is time to visit again about these pesky animals and their potential effects.

While all of the rain that we have been enjoying this summer has refreshed the native desert plants and put large quantities of much needed water in the storage reservoirs, we must not forget that standing water resulting from these rains can also bring a heavy mosquito population with its resulting risk of diseases, including West Nile Virus and encephalitis.

The best protection against West Nile Virus and other mosquito-borne diseases is to reduce or eliminate the mosquitoes that transmit the disease. You can most effectively reduce the number of mosquitoes around your home and in your neighborhood by protecting or eliminating the standing water in which mosquitoes grow and breed. Here are some suggestions of what you might need to do.

- Walk around your property. Search out, drain, and get rid of anything that can hold water, such as tin cans, containers, and used tires. Old tires rank among the most important mosquito-breeding sites in the country. Thirty-six hours is about what it takes for a mosquito egg to hatch, turn into a larva and then into an adult. Break the cycle by eliminating standing water.
- Drill holes in the bottoms of your recycling containers and outdoor planters. Check uncovered junk piles for standing water and drain them immediately.
- Clean any clogged roof gutters. Check storm drains, leaky outdoor faucets, and window wells for persistent water pools.
- Empty accumulated water from wheelbarrows, boats, cargo trailers, pet dishes, toys, and ceramic pots. If possible, turn these items over when not in use.
- Change the water in the birdbath every few days. Do not allow water to stagnate in ornamental pools, water gardens, animal watering dishes and swimming pools or their covers. Swimming pools should be cleaned and chlorinated when not in use.
- If you know of a swimming pool or other decorative pond that is not being properly cared for, speak kindly to the owner and see if he or she will soon be doing the maintenance. If you know of abandoned pools with no one to care for them, contact the Pinal County Division of Environmental Health on Vector Control & Surveillance at (520) 866-6864 for more information.

- Survey and decide whether or not you need to alter the landscape of your property to eliminate standing water. Keep in mind that during our warm spring weather, mosquitoes can breed in any puddle of water.
- Larvicides, insecticides that kill young mosquitoes, are highly effective in controlling immature mosquitoes and should be considered when standing water cannot be eliminated. These materials usually require a licensed applicator to apply these materials. Contact your home owners association, or your community or county leaders about possible programs or services to make sure insecticides are correctly applied.
- Make sure all of your window and door screens are “bug tight.”
- Check your outdoor lights. Incandescent lights attract mosquitoes, whereas fluorescent lights neither attract nor repel mosquitoes. Consider changing to fluorescent bulbs where possible.
- Stay indoors at dawn, dusk, and in the early evening when mosquitoes are most active. If you must go outdoors, wear a long-sleeved shirt and pants.
- Insect repellents when applied (sparingly) to exposed skin deter mosquitoes from biting. Spray thin clothing with repellent because mosquitoes can bite through loosely woven cloth. The American Academy of Pediatrics recommends that repellents used on children contain no more than 10 percent DEET, the active ingredient in mosquito repellents. Be sure to follow all directions on product labels. Call our Cooperative Extension office for a bulletin that will describe the proper use of repellents.
- If you have horses, goats, sheep and other livestock animals, check with your veterinarian for vaccination requirements. Horses, which are particularly susceptible, must be vaccinated for protection against the disease.
- Aerate ornamental pools to prevent development of mosquito larvae, or stock them with mosquito fish. Fish are an excellent treatment for ponds and horse troughs. Mosquito fish have a voracious appetite for mosquitoes and their larvae. As I watch the fish in our back yard fishpond, the mosquito fish seem to be saying to mosquitoes and other passing insects, “Please fly close to the surface of the water!” and “Please come lay your eggs in my pond!” They have huge appetites for insects.
- Learn all that you can about mosquitoes and West Nile Virus. A good source of information is the Pinal County Vector Control & Surveillance website called the Pinal County West Nile Virus Web Page. It can be found at on the internet. I would encourage anyone who has questions about the disease to visit this site or to contact their office at (520) 866-6864.

In order to protect ourselves from disease, it is important that all of us work together to minimize the risks that come from living in the desert.

WHITE-LINED SPHINX MOTH CATERPILLARS

We call them white-lined sphinx moth caterpillars, and, no, they are not a serious threat to your landscape and garden plants.

Recently, large numbers of yellow and black-striped caterpillars have appeared in various locations around Pinal County crawling from hither to yon for no apparent purpose. Sometimes we see them trying to cross our streets and highways. Sometimes we see them on desert weeds and grass as we hike in the desert. Sometimes, if we live next to the desert, they invade our neighborhoods, pile up in the corners of our doorsteps and crawl over our walls into our back yards.

The sight of so many caterpillars moving about can be unnerving for many and perhaps even a little scary. For others, they are a fascinating feature of the desert and a source of many questions. In any case, the more we understand about these animals, what they are and why they are doing what they are doing, the better we can deal with the phenomena. So, if you have a minute, let's visit a little about these interesting animals.

First, what are they? White-lined sphinx moth caterpillars are large, fleshy "worms" with a wicked-looking horn on their trailing ends. They are related to other sphinx moths, a group of insects that include the tomato hornworm and the citrus loving orange dog caterpillar. When they complete their life cycle, they will become the familiar, swept-wing appearing moths that some people call "tiger" moths because of their markings. They are also called hawk moths or hummingbird moths. The inner wings of these moths are colorful, flashing pink as they hover like hummingbirds over flowers while harvesting nectar.

Will they harm my garden plants? White-lined sphinx moth caterpillars seem to prefer feeding on desert broadleaf forbs, soft, fleshy annual plants that contain plenty of nutrients and the extra water needed by these animals to grow and develop. Rarely are they reported on our landscape and garden plants. Indeed, by the time that we see them wandering, they are mostly done with eating.

Where are they going? No one knows for sure. We think that they are searching for just the right place to burrow down into the soil and begin their next phase of life. Why they have to travel is still unknown. Most of the other butterflies and moths that pupate in the soil simply drop to the ground where they are and burrow in place. These caterpillars, obviously, are different. Perhaps some day someone will study these animals and provide a genetic answer to our questions.

Some people are concerned about the horn that they carry. Are they dangerous? Not really. The horn is flexible, not particularly sharp and is not used as a weapon. These animals are not poisonous. I have never heard of anyone actually being stabbed by these animals.

Do they have any benefit to people? There are reports that native Americans locally used to harvest them for food. They would dry them out and then braid them into strands that could later be added to dishes. It makes a lot of sense because in a bumper year one could put a lot of them away for leaner times.

Now that we have the big questions out of the way, let's take a closer look at insects in general. When we understand how insects as a whole work, we are better able to understand these particular animals.

Insects are a highly diverse group of animals, meaning that even though they are related, there is a lot of differences between them. These differences allow them to live and flourish in just about every climate and condition on earth. From the jungle to the mountains and from harsh outdoor environments to the incredibly friendly confines of urban houses, insects have found a niche where they can live out their lives in relative comfort and harmony with their surroundings.

Just like you and I, insects have to "grow up". This means that they must go through a series of stages of development in order to live out their lives. In some insects, their life cycles are relatively simple. They begin as an egg laid by their adult parents. They hatch into a form that looks a lot like their parents. As they grow, they swell within the hard, outside skeleton that covers their internal organs. When what is inside is too large for the old shell, they split that shell open and crawl out to begin the next cycle of growth. Some insects may do this from three to five times before they reach their full adult size. Grasshoppers, crickets and cockroaches are good examples of this type of growth.

Other insects, including the moths and butterflies, have a more complex growth pattern. These begin their life as an egg, just like all insects, but when the egg hatches the insect emerges as a larva, a wormlike stage. The larva crawls around searching for food and eats its fill. When it has stored up enough energy, it goes into a resting stage called a pupa. The pupa is sometimes called a cocoon or chrysalis, but its function is not to move around, but to simply protect the changes that must occur before the larva can turn into an adult.

Since a white-lined sphinx moth caterpillar is one of the moth and butterfly group, it has a complex development path just like we have just described. In the caterpillar stage, its sole job is to eat just as much as it can to store up energy for that which is to come. It continues to eat until it comes time for it to turn into the pupa or resting stage. At the appropriate time, the larva crawls around until it finds a spot to dig down into the earth where it changes from larva to pupa. When the adult emerges in the spring, it lays the eggs that will start the cycle once again.

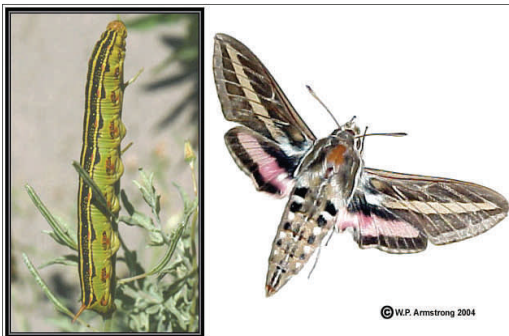
WHITE-LINED SPHINX MOTH CATEPILLARS, Continued from Page 5

If you are science-minded, you can watch this interesting process by capturing one or more of the caterpillars and placing it (or them) into a terrarium. I like to use a small fish bowl, about eight to ten inches in diameter. I fill the terrarium about half full of sand. Sand is best because it is easy digging for the larva. Place some fresh desert plants inside the terrarium for the caterpillar to eat. I like to use purslane because they seem to like it and it is easy to find right now. Purslane is the fleshy weed with round to oblong leaves. The stems have a reddish tinge to them.

Once you have your terrarium set, just watch. If you are lucky, you will see the caterpillar begin to dig down into the soil, often going clear to the bottom, where it begins to turn into the pupa. You have to take a look regularly, because the caterpillar does this without much warning and it does not take very long.

Sometimes all of this will happen right next to the glass side or bottom of the terrarium. If you are lucky and the pupa is where you can see it, you can keep an eye on progress. It is going to take some time, so don't get impatient! Weeks or months later, depending upon how warm it is where you have placed your terrarium, you will one day see an adult moth clinging to the sides of the bowl. I recommend letting the insect out so that it can start the life cycle anew.

White-lined sphinx moth caterpillars moving about the desert and crisscrossing our roads and highways are one of those surefire, telltale signs of late summer and early fall. I like to see them because they tell me without a doubt that the hot days of summer will soon be replaced by the cool nights of fall. They are simply a part of the desert, and, like spring wildflowers, come in their own time when conditions for their growth and development have been just right.



White-lined Sphinx Moth Caterpillar

DATE PALMS, Continued from Page 3

Sometimes it is difficult to find new date trees for planting in commercial nurseries. If you are having trouble locating the date palm of your choice, one way to obtain a new tree is to find an established tree of the desired variety that is producing offshoots from the base. Using an offshoot is good because that way you will be assured of getting the same high quality fruit that the parent tree gives.

Simply chisel an offshoot from the base of the mother tree, clip back the upper leaves on the trunk of the offshoot to avoid undue water stress while the roots develop, and ensure that the young plants are kept moist by wrapping it in a wet burlap sack until you are ready to plant. A special date palm chisel will make offshoot removal much easier. Offshoots are best planted in a prepared hole in the center of a basin five feet in diameter and ten inches deep.

Because date palms can grow tall, one complaint about using them in a landscape is that they can eventually dwarf other plants around them. This can be overcome if the date palm is planted at the rear of a yard, such as in a corner. Be sure to leave room between the tree and any walls so that the tree will have space to grow. The sharp points of the leaves also makes a good reason to set the tree back and away from normal outdoor traffic patterns.

The date palm provides a low water use alternative for home yard fruit production. Why not give it a try?

If you have questions, you can reach one of the Master Gardeners at the Cooperative Extension office, 820 E. Cottonwood Lane, Building C, in Casa Grande. The telephone is (520) 836-5221 ext. 204. The author's email address is gibsonrd@ag.arizona.edu.

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Richard D. Gibson

Richard D. Gibson
Extension Agent, Agriculture

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TAKE CARE OF OUR WEE WINTER FRIENDS . . .

HUMMINGBIRDS STAY YEAR ROUND!

Here in the desert Southwest there are a few species of Hummingbirds that stay year round. The Costa's and Anna's are these feathered friends. Most people take down their Hummingbird feeders in the fall or winter. But a few sips of sugar water can mean the difference between life and death for the birds. They can literally freeze to death perched on a branch if temperatures dip down too low for their energy reserves.

These little birds go into a state called torpor, which is a regulated form of hypothermia when temperatures drop too low. If day time temperatures warm them up again they are fine and return to daytime

