



Pinal County Cooperative Extension Garden & Landscape Newsletter November 2008



PROTECTING PLANTS FROM DAMAGING COLD TEMPERATURES

Are your plants ready for cold weather? Sooner or later, on a cold night very soon, a frost or freeze will occur and tender, unprotected plants will be severely damaged. It happens every winter in landscapes throughout the area. I know. In the aftermath of the storms, we field your questions.

The holiday season is a busy time for all of us and sometimes we forget to follow the weather trends. Then, when a storm blows through bringing cold weather and frosty temperatures we rue our lack of attention and promise to do better next year. Today, I am reminding you of the resolutions you made last year so that you will have time to prevent your frost sensitive plants ending up looking scraggly or dead this year. With a little planning now, followed by some timely preparations, your favorite plants can make it safely through the winter.

It is important to know the difference between a frost and a freeze. The most common type of cold weather injury occurs when low temperatures and humidity combine with calm and clear nights to cause surfaces such as leaves, soil and car windshields to cool faster than the surrounding air. When the surface reaches 32°F, even if the air temperature remains above freezing, the moisture in the air condenses and freezes in place. This condition

is called a frost. Tender plants are damaged from the cold temperatures created in the tissues during the event.

While it is relatively simple to prevent frost injury in our plants, a freeze may take a little more effort. Freezes are more widespread because they occur when air temperatures drop below 32° F.

All plants have a specific temperature at which they will begin to suffer damage. Once that temperature is reached, damage begins. Lemons, for example will begin suffering damage right around 32°F, while oranges usually do not start showing freeze damage until 26° F or below. The Florida citrus injury has sustained devastating damage from plunging temperatures in the past and the state's citrus belt has gradually moved south as a result of these freezes. Fortunately, freezes do not often occur in the desert areas of Pinal County. Nevertheless, whether it is a frost or a freeze, protection of tender plants is critical.

When thinking of cold weather protection, most people immediately think of covering their plants at night, and that is exactly right. Improperly done, however, covering will actually afford little protection and may actually harm tender plants.

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EARWIGS

With the cooling temperatures of fall, the outdoor insects are starting to search for winter quarters as they realize that their comfy outdoor living space is about to get cold. Earwigs are one of those insects that much prefer the outdoors but occasionally become indoor pests when they get lost and wander inside the home.

The earwig is essentially an outdoor insect. They hatch, feed and mate outdoors, but they are quite mobile and in their search for food, they can cover large distances. Sometimes their journeys carry them underneath loose fitting doors or other entrances into homes. Once inside the home, they often hide in cracks and crevices where they are rarely seen.

The earwig name originally came from England and finds its roots in an ancient superstition that earwigs invade the ears of sleeping people and drive them insane. Fortunately, this is not true and the species of earwigs found in Arizona cause no harm to plants or animals.

Earwigs spend much of their time in flower beds and along the bases of houses outdoors. They will also hide during the day in dark areas, such as under boards or stones. When they do emerge during the day they are usually trying to escape a rain or an irrigation water flood or to find another hiding place when their original protected area has been disturbed.

Earwigs are easily recognized by the “forceps” or “pinchers” that all stages bear at the tip of the abdomen. They have very short wings or may be wingless. Winged forms can fly although they usually move only by crawling.



Labidura riparia

Several species of earwigs occur in Arizona. Two species, *Labidura riparia* (Pallas) and *Euborellia annulipes* (Lucas), are most common. *Labidura* is winged, variable brown, and large, reaching in length of about three-fourths inch when mature. *Euborellia* is wingless, dark brown and slightly longer than one-half inch at maturity.

Female earwigs deposit their white egg masses in tunnels just below the soil surface and carefully guard them until hatching. Newly hatched nymphs are white, but gradually become darker as development progresses. A period of two or three months is required for the completion of nymphal development. Adults may live for a year or longer.

Earwigs are present throughout the year in Arizona although peak abundance occurs during spring and fall. They remain hidden during the day and come out at night in search for food. They are attracted to light and often make their way into homes because of this attraction. When they are touched or harmed in any way, earwigs emit a substance which has an offensive odor.

Earwigs feed on decaying vegetable or animal matter and other insects. The European earwig, which is a serious plant pest in some parts of the United States has not become established in Arizona. *Labidura* is known to be highly predaceous on various insects and would be classified as beneficial except when it enters homes and becomes a nuisance.

There are several steps that can be taken to solve an indoor earwig problem. The easiest solution, since there are rarely large populations within the home, is to simply remove the insect. It can be captured in a container or lifted onto a dustpan to be carried outdoors and deposited. There is rarely a need to kill the insect, just release it some distance from the door so it will not be tempted to reenter. Another solution is to use the vacuum to remove the insect.

Prevention can help solve a problem before it happens. Check all doors, windows and other possible entry points and seal off the cracks with weather stripping or caulk. Make sure that the

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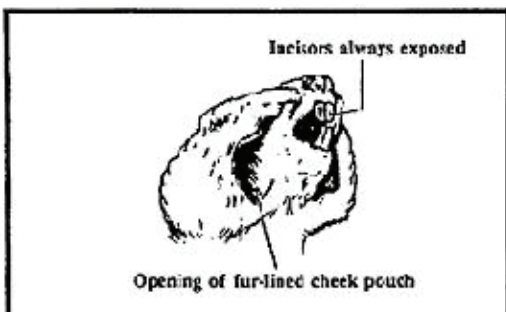
POCKET GOPHERS

New, crescent-shaped mounds of loose soil popping up out of the lawn or garden like dandelions in the spring are an indication that a pocket gopher is hard at work.

Pocket gophers are mammals that live mainly beneath the surface of the soil. They can cause significant damage to lawns, gardens, plastic irrigation tubing and agricultural fields. As long as there is water and tender plant roots around, they are indiscriminate in where they set up housekeeping. Mounds of soil with a two-inch dimple on top are the trademark of the pocket gopher. If you are fighting one or more of these pests, a few facts may help give you the upper hand.

Do not confuse the pocket gopher with the common everyday ground squirrel which also lives in a burrow. Unlike the gopher which closes the door to its home, the ground squirrel prefers to leave its open.

The mature pocket gopher reaches a length of five to seven inches and is covered with pale to dark brown soft fur. It is heavy bodied with a wide head, very small ears and eyes, and a tail that can reach three and one-half inches long. The front feet are enlarged and are armed with long claws suited for digging. The long upper and lower front teeth make it easy to chew on roots and tubers.



Because pocket gophers spend their entire lives in the soil, leaving only occasionally to feed on the surface or to travel to a new area, most people will not recognize them if they chance to encounter one above ground. However, the presence of fresh, loose mounds of soil is a dead giveaway that they have arrived.

Gophers build extensive horizontal, below ground tunnel systems at a depth of approximately four to sixteen inches. Occasionally they will send up a vertical shaft to the surface to admit air and to provide an exit if necessary. It is at the end of these vertical tunnels that the soil is deposited.

Gophers dig with powerful front feet and push excess soil up the vertical shafts to deposit it in mounds above ground. After the day's work is done, the gopher closes the door by pushing a load of fresh soil into the opening and effectively seals itself off from the outside world. The dimple on top of the mound is the door.

Interestingly enough, gophers usually live alone in one tunnel system, but the young may remain in a female's habitat for a short time after leaving the nest. Gophers have also been known to move into another tunnel if it is vacated.

Once it is time for the young gophers to find their own home, they may have to travel some distance to find a suitable location. Adults will also pack up and head out in search of new digs when food sources run low. During this time above ground they are extremely vulnerable to cats, dogs and other potential predators because they are relatively slow and cumbersome in their movement.

Gophers are strictly plant eaters. They can subsist on the roots of grasses, but they much prefer tubers, bulbs and the roots of weeds and shrubs. Given time, they can kill small shrubs and can cause extensive damage to vegetable and flower gardens. They are also pests of agricultural fields. They are especially destructive when they burrow into the sides of earthen ditches. Frequently, water from these

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GROWING AVOCADOS IN PINAL COUNTY

The avocado tree is a common fixture in the yards of many coastal California homes. Can it be grown in Southern Arizona? The answer to that question is a qualified yes, with a big maybe tacked on to the end.

The avocado tree has many desirable qualities that make it attractive in a home yard. Its relatively large height and spread allows it to provide deep shade over a large area. The shape and texture of the leaves and branches make it an attractive addition to any landscape. Best of all, the fruit makes great guacamole. For these, and other reasons, the tree is a big hit on the west coast. The question is: can it grow in the desert?

This question is often asked, and sometimes debated. If you look at the literature, there seems to be enough leeway to say that under certain circumstances, home grown avocados might be possible in our area; but, no one is willing to go out on a limb and say that it can definitely be done. This reluctance, coupled with the fact that avocado trees are just not often seen in the desert, makes the idea of planting one seem like a lost cause from the very start.

It is not that people have not tried to grow avocados here in the desert. Countless avocado seeds over the years have been pricked with toothpicks and placed bottom down into a jar of water until the seed begins to root. Many of those have been transplanted to pots and tenderly cared for until they start to grow. Some, when they have gained some size, have even been placed outdoors under a patio or in the shade of a tree, in large containers. I would guess that some have even been transplanted into the native soil with the hopes that it would take off and grow to full size. Yet for all of that, where are the full-grown, mature, fruit-producing trees? Except for mighty few exceptions, they just do not exist.

So, with no official recommendations from the professional horticulture types, and in the absence of any well known examples to the contrary, once again the question must be asked, "Can avocados really prosper here?" The answer may lie in the relative success of a few tucked-away specimens alive and apparently doing well in the desert.

One tree is found in the courtyard of a four story U-shaped convent in Tucson. Apparently the protected area keeps off the frost and hot, drying winds. It also gets careful and constant care. It is said to produce fruit.

Another is a magnificent tree started from a pit 50 years ago on a beautiful old estate on North Central Avenue in Phoenix. There probably is enough elevation change that cold air drains past it fairly quickly during frosty nights. It also has flood irrigation, which probably makes a big difference. The fruit look like a zucchini squash, which is probably due to poor pollination.

There are reports of other trees in various parts of the state, including some here in Pinal County. None seem to do really well. In Pinal County, the only tree that has been reported is now deceased. It was being grown in a lean-to greenhouse under misters. The greenhouse was removed when the house received an addition. There may also be other trees that are hidden, lost or not documented growing in favorable spots throughout the southern part of the state.

So, there it is, a horticultural challenge if there ever was one; a quest for only those who are brave of heart. Can the avocado successfully grow to maturity and produce fruit in Pinal County? For those who may want to give it a try, here are a few points to consider.

First, avocados must have good soil drainage. They just do not like to have their feet wet. However, the roots must remain relatively moist to ensure good health. The best soil would probably be a deep, loose, silty sand that accepts water easily and drains well. Light, frequent water applications would be essential.

Another key would be to prevent the buildup of salt within the root zone. Every third or fourth irrigation, a deep, flushing irrigation would need to be applied to dissolve salts and push them down deep into the soil, past the relatively shallow roots of the tree.

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When covering plants, it is best and safest to use a fabric covering material. Plastic tarps and table cloths will not provide sufficient insulation to keep plants warm during heavy frosts and freezes.

Remember, natural cold descends from the atmosphere during the night. Natural warmth radiates upward from the earth, which is heated during the day by the sun. When the amount of cold overpowers the amount of radiated heat and temperatures go below what sensitive plants can endure, cold damage can occur. Coverings shelter plants from the cold air that is descending down upon the plants and trap the radiated heat that is moving upward from the earth. This minimal protection often is quite sufficient to keep tender plants from harm, particularly during frost events.

In order for coverings to be successful, plant covers must accomplish each of these two tasks. To do this, they must extend all the way to the ground. Full coverage will keep the warmer air trapped inside from escaping. They must also be put in place before it begins to get cold, which usually means late afternoon. They must not be removed until temperatures rise to a safe level, usually well into the following day. Covers are removed to allow the sun to reheat the soil underneath the plants. This will provide warmth for the next nights protection.

Cloth, cardboard or paper coverings insulate better against the cold than plastic coverings. However, plastic could work for frost protection if the temperatures do not dip too low. Plastic tends to radiate heat faster than these other coverings and are a little more risky to use. In a pinch, and if plastic is all that is available, rig a frame to hold the covering off of the plant foliage. The cold temperature of the plastic itself could damage tender plant tissue.

Extra warmth can be provided for the most tender or most valuable plants, by placing a low watt light bulb inside the covering. The extra heat from the light bulb can help keep the air temperatures inside the tent high enough to avoid plant tissue damage. In doing this, do not forget safety. Do not let the light bulb touch the

covering or the leaves or stems of the plant. Coverings could catch fire and tender tissues can be damaged by the heat.

Use an outdoor extension cord and make sure that there is no standing water that could cause an electrical hazard. Do not forget to turn the light off during the daylight hours to save money and avoid the possibility of plant damage.

Commercial citrus producers use large fans to warm air around the trees by mixing cold air trapped against the surface of the earth with the lighter warm air above. They also occasionally, during the worst weather, will flood irrigate the trees during a freeze or frost. Neither of these are recommended for the home owner. Fans are expensive, must be placed high enough to encounter the warm air and are noisy, all of which make fans impractical in the home environment.

Flood irrigating works on the principle that water must give off heat to freeze and the slight amount of heat released can moderate the sharp plunges of temperature during a frost. Flooding is risky because water must be present for the complete duration of the freeze or frost or the colder temperatures resulting after heat release may worsen the damage.

The easiest form of frost protection is to create and use microclimates in the garden. Citrus trees, for example, do well in the narrow spaces between houses because the close proximity of the walls tend to protect them from plunging temperatures. Heat-loving and frost sensitive plants like bougainvillea and hibiscus seem to do best on south-facing walls with an overhanging roof.

Cold weather protection requires planning and careful watching of weather patterns. If we are not alert, damaging temperatures may creep up on us unawares. A little time spent in planning and preparation before cold weather injury occurs will definitely result in healthier plants and a lot less work later on.

—EARWIGS, Continued from Page 2

door fits snugly over the step and inside the door frame to eliminate gaps or spaces that could allow the insect to enter.

Insecticidal control of earwigs should mainly be directed to the breeding areas outside the home. This usually involves treating the soil along the edges of buildings and concrete slabs, and in flower beds. Occasionally, however, it is necessary to treat an entire lawn when favorable soil conditions, including an abundance of organic matter, cause earwigs to become generally distributed over an area.

Control may be obtained with granular formulations of lawn insecticides. These are available in most garden stores and are convenient when large areas are to be treated. Apply the materials at the dosage specified on the container label. Two to three applications of the insecticide at weekly intervals may be necessary to obtain complete control.

Migration from nearby untreated areas may allow the insect to reinfest areas that have been previously treated. In these cases, it may be necessary to retreat on a regular basis until the populations no longer continue to build.

When earwigs become a regular nuisance inside the home, it may be necessary to treat cracks, crevices, and other hiding places with an appropriate liquid insecticide designed for indoor use. Insecticides formulated for use outdoors should never be used indoors. The label will tell which product can be used indoors. Always check the label for correct directions.

Indoor pest control can be performed by professional pest control operators. If you prefer to do your own pest control, there are a number of products that can be purchased for indoor use. These residual crack and crevice sprays can be found at most home care centers.

The duration of insecticidal activity of indoor insecticides will depend upon many factors, but all of the do-it-yourself formulations should give at least a couple of weeks of control. If and when insect populations begin to rebuild, you may have to treat again.

The earwigs found in Arizona are harmless and cause no damage to plants or animals. Their abundance and offensive odor when crushed, however, often make prevention or control desirable. Personally, I just sweep them up and toss them back outside.

—AVOCADOS, Continued from Page 4

The mature avocado is reported to need about one pound of actual nitrogen per tree per year, so nitrogen applications would be important. However, young trees require much less. Every other month or so, young trees would need a very light application of standard fertilizer, like ammonium sulfate or ammonium phosphate. Liquid formulations would also work. Over application of nitrogen fertilizers could burn tender roots.

Avocado limbs are brittle and the leaves are large. When it comes time to plant the tree in the ground, be sure to find a location where it will be protected from the prevailing winds and will be provided some protection from winter frosts.

Finally, the avocado is a complex and diverse species. There are several types or races, the Guatemalan and the Mexican types being the most common. Before selecting a variety, learn more about each of the varieties and select carefully.

The avocado should be able to grow in protected locations in the desert areas of Pinal County. Granted, they may not thrive here like they do in Southern California, but it should be possible. If you are looking for a new horticultural challenge, give the avocado a try. Let me know how it goes.

Trade names used in this publication are for identification only and do not imply endorsement of products named or criticism of similar products not mentioned.

ditches will find the holes and, running through the soil, erode away the sides of the ditch. If the ditch gives way, a lot of water ends up running where it does not belong.

Gophers can cause considerable damage to power tools such as mowers and edgers as the blades come in contact with the soil excavated from the tunnels. It is a good idea to smooth out the mounds before using these power tools and please don't forget to use safety eye protection to avoid injury from flying debris.

If gophers and their mounds become a problem in the yard, there are several options available to cut down or eliminate the population in a given area. There are four recognized ways of controlling pocket gophers in the home yard: trapping, gassing, poisoning and excluding.

Exclusion is only effective in small garden areas or where cost of control is not a factor. Selected areas can be protected by placing metal sheeting or concrete twenty-four inches or more below the soil surface and ten to twelve inches above ground level. Light, sandy soils may require deeper protection, perhaps down to thirty-six inches in order to keep the animals out.

For the other methods of control, the actual underground tunnel will have to be exposed. This can be quite challenging for those who are not experienced. Even though the soil in the mound is usually quite loose, it can be easily compacted during excavation. When that happens, it can be difficult to find the tunnel again. I like to use an old teaspoon to carefully and lightly follow the tunnel down from the dimple to the main lateral underneath the ground.

Poison baits are sold that, when used correctly, can provide some control. Poison granules must be placed into the tunnel in a way that does not warn the gopher that something unusual has occurred. For this reason, avoid handling the bait with your bare hands. Handling the bait will transfer your human smell to the bait and possibly forewarn the animal to avoid the bait altogether.

Use a long handled spoon to place the bait well into the tunnel away from the area disturbed by unearthing the tunnel. By placing the poison into the tunnel, it also reduces the potential for non-target animals like birds, pets and other animals to find and consume the bait.

Trapping is the most sure way of knowing if the animal actually has been killed. It is also the method that is usually the most successful.


Macabee gopher traps are available from many nurseries and hardware stores. At least two need to be set in each tunnel, one pointed up the tunnel and the other pointed in the opposite direction. Both need to be wired to a stake driven into the ground outside the tunnel to prevent trap loss. Be sure to remove all of the soil from the tunnel to make room for the trap.

After applying one or more of the control methods, watch for new mounds of soil. If none appear, it is safe to conclude that activity in the burrow has ceased.

By carefully and intelligently applying gopher control techniques, safe control of these pests can be achieved.

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

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