

Master Gardener
University of California



The Curious Gardener

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The University of California,
Agriculture and Natural Resources,
Making a Difference for California

Growing in a Greenhouse – the Agony and the Ecstasy

Article and Photos by Bonnie Bradt, Rob Chase and Michael Kluk,
Nevada County Master Gardeners

Introduction

A greenhouse is all about control. You are modifying the natural environment in an attempt to produce healthier plants or certain plants at a time that the outside environment would not be friendly to them. This is the first of a four-part series that will be published in the *Curious Gardener*. This part will cover the critical heating and cooling of a greenhouse. Other topics to be covered in coming articles will be lighting, sanitation, air circulation, humidity control, control of pests, water conservation and ensuring adequate pollination. This series will not cover greenhouse construction except to the extent it is necessary to cover one of the other topics.

The primary environmental elements one can control in a greenhouse are temperature, light, moisture, air circulation, nutrition, and cleanliness.

You may invest the energy to fully control all of these elements or you may make passive or structural modifications that bend the natural environment to your advantage. Higher control usually requires a greater investment of energy and money.

Since the greenhouse structure insulates plants from the natural elements, it is up to the operator to manage these elements to achieve the desired environment. Both relative humidity and soil moisture can be controlled by the measured

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A lean-to greenhouse is easily accessible and allows for heat exchange between the house and greenhouse

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introduction of water. Temperature can be controlled by heating, cooling, or ventilating. Light can be controlled with artificial lighting or shading. Air circulation can be controlled with both powered and non-powered ventilation and circulating fans. Soil and nutrition can be controlled by growing in containers or amending the natural soil within the greenhouse. Cleanliness can be achieved by taking a disciplined approach to greenhouse management. In this and the upcoming sections, we'll look at each of these environmental factors in more detail.

Heating and Cooling

It will always be necessary to heat and cool a greenhouse depending on conditions. Even in the winter, most greenhouses in our area will need to be cooled on a sunny day. Heating and cooling of a greenhouse can be active, using stoves, electric heaters and evaporative coolers, or passive, using energy from the sun for heat and venting and shade for cooling. You can also have a hybrid version, some passive elements combined with a smaller heater and cooler than would otherwise be necessary.



Shade cloth and large windows help cool a simple plastic covered greenhouse

A true “solar” greenhouse will use only passive heating. This involves some means to capture and store the heat of the sun so that it can be released at night. Solar greenhouses often have a solid and well insulated roof and end walls with south facing, double-glazed glass angled so that it is hit directly by the low winter sun. Insulating curtains can be pulled in front of the windows at night. This can save up to 90% of the heat that would otherwise be lost through the glazing. The orientation of a passively heated greenhouse is important. It should be oriented east west with the long side facing due south. If you do not want to build a structure this elaborate, some additions to a simple plastic or glass greenhouse can go a long way to allowing you to grow at least moderately cold sensitive plants into the winter.

All passive greenhouses rely on some “mass” that is warmed by the sun and then stores that heat to release at night. This can be simply the soil in the greenhouse but is often water, masonry or stone. Water, stored in black containers, is the most practical option. Given the same volume, water will store twice the heat of masonry or stone. It is also cheaper and easier to move around. Masonry or stone makes sense only if you are going to build part of the structure out of brick or rock. It takes a lot of mass to significantly influence the temperature inside a greenhouse. For example, for season extension in an insulated, double glazed greenhouse in our temperate climate, it will take 2 gallons of stored water or 80 lbs. of rock or masonry for every square foot of glazing. Detailed information is available on-line.

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Vents in a greenhouse roof should allow for opening of at least 20% of the roof area

Passive cooling involves venting heat from the greenhouse. Both manual and automatic vents are available. Ideally you should be able to open at least one fifth of the roof area. You will also need openings for cooler outside air to enter near the floor of the greenhouse. If it is difficult to install vents in the roof, as in a plastic covered hoop house, you can install large windows and provide for the capacity to roll up at least one side.

If you use the greenhouse in the summer, covering it with 50% shade cloth also yields big passive cooling benefits. It lets in enough light to grow even tomatoes and peppers but reduces the temperature significantly. Shade cloth can also be put on and taken off of a small greenhouse as the seasons are changing.

For active cooling, a simple fan that is able to completely evacuate twice the volume of air in the greenhouse in 60 seconds may be enough, with good vents, to provide ample cooling. If you need more, an evaporative cooler is a step up. Evaporative coolers have the added benefit of humidifying the air which can be important for some plants.



Water stored in barrels can absorb the heat of the sun during the day and radiate it out into the greenhouse at night

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Other options may include constructing your growing beds with double walls, sandwiching insulation between them. Solid, insulated doors can be constructed to close over your planting beds at night. Another simple approach is to use row cover or plastic stretched over hoops inside the greenhouse to provide a second layer of protection.



An insulated bed inside a greenhouse adds an extra layer of protection for your plants

A “lean-to” greenhouse connected to the south side of the house has the benefit of an already well insulated wall. Using fans and a vent or window, you can pull heat from the greenhouse into the house during the day and at night pull heat from the house into the greenhouse.

Active heating options involve an electric heater or a properly vented gas or wood stove. The common recommendation for an electric heater for a hobby sized greenhouse is 1500 watts. Greenhouse coolers and heaters can be controlled by a thermostat to turn on and off at preset temperatures. You can also install humidity monitors. All of this information can be sent into your house where you can monitor your greenhouse from your easy chair.

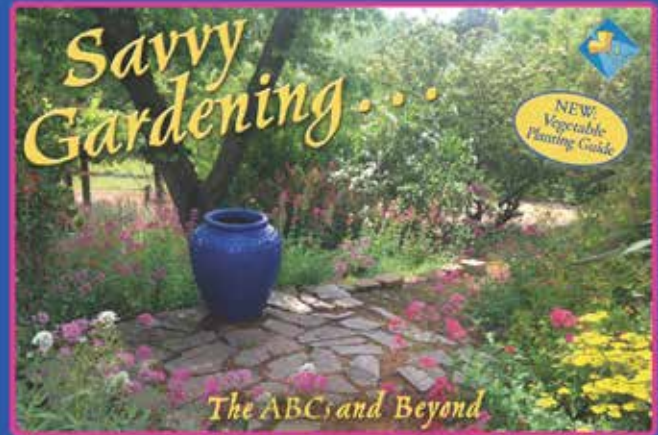
Effective heating and cooling is critical for you to have success growing in a greenhouse. Passive heating and cooling approaches can be adequate in our climate. Active heating and cooling systems may be more dependable and somewhat easier to manage. It is possible to supplement a passive system with a small active system to help during extreme weather conditions.

In the next *Curious Gardener*, we will cover greenhouse sanitation and lighting, so be sure to look for it.

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Available Now, from the Master Gardeners of Placer County: 2016 Gardener's Companion Calendar!



**A Gardener's Companion
2016**

A 13-Month Calendar Presented by the
Master Gardeners of Placer County
University of California Cooperative Extension

This year's 13-month calendar, “**Savvy Gardening... The ABCs and Beyond**” is filled with articles to help gardeners improve their gardening skills. This colorful calendar offers a sampling of methods used by savvy gardeners to create and maintain their beautiful landscapes, along with where to find more information to build expertise.

Features of the 2016 calendar include:

- An **all-new Placer County Vegetable Planting Guide** featuring colorful planting and harvesting timelines.
- Daily gardening tips to remind gardeners of what to do and when to do it.
- Updated “What to Plant” sections, with timely advice on what to plant throughout the year.
- “In Season at the Market,” a listing of fresh produce to look for each month at farmers’ markets.

Calendars are now available at nurseries and businesses in Placer, Nevada, and El Dorado counties, at the Placer County Master Gardener office and on our website. A list of vendors and how-to-order details are listed online at pcmg.ucanr.org/2016_Calendar/. Calendars will also be for sale at the master gardener booths at the following:

- Mountain Mandarin Festival (November 20-22),
- Auburn Farmers’ Market (1st & 3rd Saturdays, September through October)
- Farmers’ Market at the Fountains in Roseville (every Tuesday, September through October).

Trees and Artificial Turf

By Laurie Meyerpeter, Placer County Master Gardener

It's been a hot, dry summer and at my work at a local nursery it's been a summer of tree sales. Many trees have died and homeowners have come in looking for a tree to replace a dead one in their landscape. Sometimes the tree died because of lack of water. Sometimes a tree had wide-ranging roots into a neighbor's yard and the neighbor decided to let their lawn die without realizing that they were also sustaining the tree next door. Sometimes a homeowner replaced lawn with a major water-wise landscape project and the poor tree had roots severed or damaged. But something peculiar I noticed was that many trees had died in yards that had recently installed artificial turf.

Initially, I had rationalized that these trees were no longer getting water from the lawn or that the artificial turf installation had compacted the soil. But some of these situations just didn't fit. The trees weren't particular fussy trees either. I remember one day a customer replaced a London plane tree that had died and a second customer replaced a Chinese pistache, both of which were growing near recently installed artificial turf. So I decided to research the effects of artificial turf on the surrounding landscape.

I had wanted to find scholarly articles that specifically addressed surrounding landscape plants and trees rather than information from the artificial turf industry but found few if any university articles that addressed this specific subject. However I did find university research that had been done on artificial turf as it related to heat on sports fields. And if the findings can be applied to landscape plants, it doesn't bode well for trees!

Brigham Young University researchers took temperature recordings of air, surface, and soil temperatures for different fields of artificial turf and at different times of the day. Results were shockingly high. Surface temperatures of artificial turf were 37 degrees higher than asphalt and 86.5 degrees higher than grass. And 2 inches below the soil, the temperature was a whopping 28.5 degrees hotter under artificial turf than under natural grass. The highest surface temperature recorded was 200 degrees on the artificial turf on a day when the local Provo, UT temp peaked at 98 degrees. And although soaking the artificial turf with water cooled the area, it took just a little over 20 minutes for the temperature to return to the previously high temperatures.

Other universities have replicated these findings including one done at the University of Nevada, Las Vegas, which found that artificial turf can heat up to 170 degrees in the warmer months. The study only ran from August through May and did not even include the hottest months of the year.

The implications of this on surrounding landscape plants is tremendous. Even though artificial turf in residential areas typically covers significantly less square footage than used on playing fields, the research shows that artificial turf greatly increases the surrounding temperatures both above ground and in the soil. Increased temperatures can increase water requirements of trees, and if temperatures are high enough, can cause damage to the plant. There are many explanations for tree death but it appears that artificial turf can be a possible contributing factor.

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Fall foliage photos by (top to bottom), Lexy Martin, Laurie Meyerpeter, Pauline Sakai



Insect Trivia: Mosquitos

by Bonnie Bradt, Nevada County Master Gardener

It may only be tiny but the mosquito has been man's greatest adversary in the animal kingdom, affecting social policy and even wars. This quiz should teach you a little more about this tiny annoying resident of most gardens.

1. The name for the mosquito comes from the Spanish language.

What does it mean?

- a. Swamp dweller
- b. Little fly
- c. Biting fly
- d. Disease carrier

2. Mosquitos are well-known for having a major role in the transmission of malaria into humans, but what exactly is that role?

- a. The malaria parasite develops inside the mosquito larvae
- b. The mosquito acquires the parasite from one human and passes it on to another through its saliva
- c. The mosquito passes on germs acquired from dirty water to humans
- d. The mosquito deposits its feces onto a person's skin as it feeds

3. Only female mosquitos feed on blood.

- a. True
- b. False

4. As well as malaria, which of the following diseases does the mosquito act as vector agent for?

- a. All of these
- b. West Nile Fever
- c. Yellow Fever
- d. Dengue Fever

5. How does the chemical DEET help protect against mosquitos and malaria?

- a. By killing mosquitos that come into contact with it
- b. By giving off a "scent" that disorients the mosquito
- c. By making it impossible for the malaria parasite to pass into the bloodstream
- d. It makes the skin impervious to the mosquito's proboscis

6. Which feature of the adult insect do the pupae of *Culex* mosquitos lack?

- a. Thorax
- b. Head
- c. Mouth
- d. Abdomen

7. Which chemical, formerly known as Neocide, was pushed by the USA as the tool to eradicate the world's mosquito population only for its use to be declared illegal at the end of 1972?

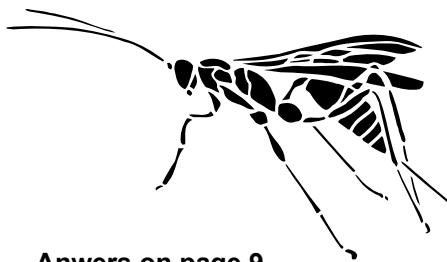
- a. Permethrin
- b. DDT
- c. Scourge
- d. Malathion

8. Before the widespread use of insecticides what was the most effective measure employed by civil authorities against mosquito-borne disease?

- a. Improving the morals of the population
- b. The imposition of quarantine on infected areas
- c. Teaching the local population how to clean themselves properly
- d. Draining sources of standing water

9. Which drink was introduced by the British Army into its colonies to help fight the spread of malaria?

- a. Bourbon and Coke
- b. Gin and Tonic
- c. Vodka and Orange
- d. White Rum and Lime



Answers on page 9



For Information about Mosquitos and How to Manage Them, See the UC Davis IPM Pestnote:

www.ipm.ucdavis.edu/PMG/PEST-NOTES/pn7451.html

And Check Out These Videos:





Epilobium canum, California Fuchsia

by Lynora Sisk, Placer County Master Gardener

Attracting hummingbirds and adding color to your garden can be easy with this California native featured at the UC Davis Arboretum. California fuchsia is a perennial plant with orange –red tubular flowers that can bloom up to 2 months during the late summer and fall. For best flower blooming, you'll want to plant this fuchsia in full sun where it will tolerate heat and drought. Yes, a plant that will be happy in our drought!

There are many different varieties of California fuchsia with narrow or broad leaves that range from silver to bright green. Depending on the variety, you can choose from low matting plants such as 'Everett's Choice' or shrub size plants like 'Catalina' that can grow up to 4 feet. Unlike its tropical cousin the "hanging basket" variety of fuchsia, this native needs well drained soil, very little water and lots of sun.

California fuchsia is very easy to propagate from seed, stem cutting or division. If you have access to established plants, the simplest method is to dig up several stems with roots and rhizomes attached in the fall or winter. Plants are also available at local nurseries or native plant sales and are best transplanted in the Fall/Winter. Like most California natives, you may need to apply a little water for the first year until it is established.

If you're looking for a drought tolerant plant that requires little care, this one's for you. The only pruning you'll need to do is cut it to the ground after its fall blooming. This will help it come back more lush and with more blooms for those hungry hummingbirds.

For more information, UC Davis Arboretum has posted a YouTube video that features the variety 'Everett's Choice.' <https://www.youtube.com/watch?v=ohKYD71FGqw>
Enjoy and happy gardening!



©UC Davis Arboretum

References:

- UC Davis Arboretum website: http://arboretum.ucdavis.edu/allstars_detail_12.aspx
- Tulare/Kings County Master Gardener Newsletter, November 2011
- Golden West College website, Plant of the Month, August 2010 <http://www.goldenwestcollege.edu/garden/plantofmonth/index.html>

Looking to Buy Arboretum All-Stars?

The Friends of the UC Davis Arboretum hold plant sales at the Arboretum Teaching Nursery several times a year. Upcoming Fall sales are as follows:

October 10, Members-only from 9:00 to 11:00 am (you can join at the door); the general public is admitted from 11:00 am to 1:00 pm.

October 24, Open public sale from 9:00 am to 1:00 pm.

November 14, Clearance sale from 9:00 am to 1:00 pm.

For more information, go to http://arboretum.ucdavis.edu/plant_sales_and_nursery.aspx

Some Truths About Neonicotinoids

by Elaine Applebaum, Placer County Master Gardener

Let me start by saying I am a tree-hugging organic gardener who loves honeybees and native pollinators. I also have worked in a retail nursery and love wine and fresh California-grown citrus. So I felt pulled in opposite directions when I attended a recent conference hosted by the California Center for Urban Horticulture (CCUH) titled “Truth or Myth? Neonicotinoids and Their Impact on Pollinators: What is the Science-Based Research?”

Controversy surrounds the use of neonicotinoids, or “neonics,” a class of insecticides commercially available in California since 1994. On one side are those who see them as a major contributor to the decline of honeybees and other pollinators; on the other are those who see neonics as one of the best tools to manage serious crop and nursery pests. In the middle are many confused gardeners and consumers. This conference brought together people from all sides interested in looking beyond the sensational headlines to what scientific research has shown. Anyone hoping for definitive, easy answers went home disappointed. As one speaker quoted Facebook, “it’s complicated.”

An over-riding theme throughout the conference from all presenters is that much more research still needs to be done on how neonicotinoids affect pollinators. The scientific method requires researchers to maintain controls and test only one variable at a time, which makes for slow progress in the search for answers. There are many factors affecting bee health, and the ecosystems in which they live are extremely complex. It is difficult, if not impossible, to run controlled experiments in the field and equally difficult to recreate natural conditions in a lab.

There is no question it is a tough time to be a bee. Unless you’ve spent the past few years under a rock, you have heard about Colony Collapse Disorder (CCD). Wouldn’t it be lovely to find a single villain, outlaw it and ride off into the sunset knowing we saved the bees? Many bee lovers want to believe neonicotinoids are that villain. But life is rarely simple and the truth is, neonics are only one small piece in the CCD puzzle, not the sole culprit. Additional suspects include other insecticides, herbicides, fungicides, parasites like the varroa mite, habitat loss, the stresses of hive transport, imported species and climate change. The true cause of CCD is most likely a combination of many or all of these factors. Banning neonicotinoids will not singlehandedly save the bees.

Neonics are used by farmers and in production nurseries; they are also in many lawn and garden products marketed to homeowners. You will find them listed on labels as the active ingredients imidacloprid, acetamiprid, clothianidin, dinotefuran, and thiamethoxam. They are applied to plants in a number of ways: sprayed onto leaves, injected into tree trunks, or incorporated into the soil as either granules or a liquid drench for uptake by the roots. Some crop seeds are treated with a neonicotinoid coating. Regardless of application method, the chemical is transported systemically upward through the plant. Insects can be killed by direct contact during application, by exposure to residual amounts left in the environment and by eating parts of plants that have been treated systemically.

Research has shown that bees are indeed killed when they come into direct contact with neonics. This is why labels instruct users to not spray when bees are in the area. However, there is not yet clear evidence showing bees are harmed feeding on pollen and nectar from plants treated systemically. One study (Jin et al. 2014) showed chronic exposure to field-realistic doses of clothianidin affected the sensory perception and navigational abilities of *Osmia cornuta* bees (native to Europe). Unfortunately, there have been very few studies like this that look at long-term repeated exposure to sub-lethal doses of neonics. Similarly, there are few studies on how they affect native bees or what harm is caused to soil organisms through applications of neonic soil drenches and granules. Neonics persist for a long time in the environment.

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Photo by Pauline Sakai,
Placer County Master Gardener

Neonicotinoids are toxic to honeybees, but important tools to control invasive insect pests like the Asian citrus psyllid and glassy-winged sharpshooter.



Adult Asian citrus psyllid,
Photo by Michael E. Rogers,
University of Florida.



Adult glassy-winged sharpshooter
with eggs laid in leaf.
Photo by Jack Kelly Clark.

*Carpenter bee
on Passion flower,
photo by Elaine Applebaum*



Want to Help Bees? Plant a Pollinator Garden!

Read how on the UCANR Bug Squad Blog, *'Bee' One in a Million*, by Kathy Keatley Garvey, published on September 23, 2015

<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=19052>

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So why don't we follow the lead of European countries and restrict the use of neonicotinoids until research is completed? In a word, economics. Agriculture in California is a \$46 billion+ industry. It is threatened by some serious invasive pests, most notably the glassy-winged sharpshooter and Asian citrus psyllid, which vector Pierce's disease and Huanglongbing respectively. These diseases have the potential to devastate the wine-grape and citrus industries. Growers in affected areas use neonics in an attempt to eradicate the pests; production nurseries use them to assure pests don't hitch a ride to uninfected areas of our state. Like it or not, if neonics were to be outlawed, other products that are just as toxic to bees (if not more so) will be used.

Neonicotinoids appear to be the lesser of possible evils. Due to their mode of action, they are less toxic to mammals (including human applicators) than other commonly used insecticides. Furthermore, they provide an alternative to chemicals such as pyrethroids, to which many insects are developing immunity, rendering them less effective. If they are applied properly, in accordance with labeling, harm to bees and other beneficial insects can be minimized.

My take away from the conference? Personally, I will continue to garden organically, and encourage other home gardeners to avoid neonicotinoids and other pesticides. But I will not get on the bandwagon to ban neonics or condemn those in the farming and nursery industries who choose to use them so that I can continue to enjoy my wine and citrus. And I will applaud and support those scientists who plug away methodically and patiently every day to discover the truths behind media-induced myths.

References

Topics and Presenters at Truth or Myth?

Neonicotinoids and Their Impact on Pollinators: What is the Science-Based Research?

UC Davis Conference Center, September 9, 2015

- **Overview of Current Use of Neonicotinoids and the Role of Pollinators in California Agriculture**
Dr. Michael Parrella, Professor & Chair, Department of Entomology and Nematology, UC Davis
- **California Pesticide Regulation of Neonicotinoids**
Brian Leahy, Director, CA Department of Pesticide Regulation (DPR)
- **Neonicotinoid Risks Associated with Invasive Species Management**
Nick Condos, Director, CA Dept. of Food and Agriculture, Plant Health Division
- **Trends in Neonicotinoid Usage in CA Agriculture Invasive Species Control**
Dr. Karen Jetter, Associate Project Economist, UC Agricultural Issues Center
- **"Past" Neonicotinoid & Pollinator Research**
Margaret "Rei" Scampavia, Doctoral Candidate, Department of Entomology and Nematology, UC Davis
- **"Current" Neonicotinoid & Bee Research**
Dr. Elina Lastro Niño, Extension Apiculturist, Department of Entomology and Nematology, UC Davis

Mosquito Quiz Answers:

1. B. Little Fly. “Mosca” is the Spanish word for fly and mosquito is its diminutive form. The first recognized usage of “mosquito”, appears in 1572 and was coined to distinguish the mosquito from the house fly. Prior to this point, the Spanish referred to mosquitos as “biting flies”.

2. B. The mosquito acquires the parasite from one human and passes it on to another through its saliva.

The cause of malaria is the parasitic protozoa, *Plasmodium*. There are four types of *Plasmodium* that can infect humans. The most common is *Plasmodium vivax*, which is rarely fatal.

The rarest is *Plasmodium ovale*, which also causes a relatively mild illness.

Plasmodium malariae causes a severe fever but is also rarely life threatening. The fourth species is *Plasmodium falciparum* which is much more vicious than the other three pathogens and frequently causes death. The spread of the disease requires a human host who is already infected with the parasite. An *Anopheles* mosquito (the genus which can transmit the disease) can then

ingest the parasite by feeding on this human host. From the point of ingestion, the *Plasmodium* sporozoites find their way from the mosquito’s stomach to its saliva glands and the mosquito is ready to pass them on to the next human on whom they feed.

3. A. True. Mosquitos mainly feed on nectar, rotten fruit or honeydew excreted from other insects. However, the female mosquito requires protein for the production of eggs, and blood is the food from which it obtains this. Only a small number of the many species of mosquito feed on human blood.

4. A. All of these. The many varied species of mosquito are also responsible for the transmission of many varied diseases. In North America, it is the vector agent for Eastern Equine Encephalitis virus (EEE), better known as sleeping sickness, a rare but dangerous disease affecting humans. The mosquito acquires EEE from birds and not the horse as its name might imply, although horses can become infected with the virus.

5. B. By giving off a “scent” that disorients the mosquito. The primary role of DEET is as a protecting agent against tick and mosquito bites which it does by giving off an aroma that blocks the insect’s ability to detect the aroma of lactic acid or carbon dioxide, thereby blinding the insect to the presence of a human or animal target.

6. C. Mouth. This is an important factor in the control of mosquito populations. As the pupae do not feed, the best means of control is to suffocate the pupa by the application of oil to the surface of the water on which the eggs have been laid.



7. B. DDT. DDT (Dichloro-Diphenyl-Trichloroethane) was first used as a de-lousing agent on Axis prisoners of war during World War II and it was noticed that not only did DDT kill the insects but it kept on killing them long after the chemical had been sprayed. A further success on a larger scale came when DDT was used to treat the people of Naples who were suffering with Typhus following the German destruction of the sewer system in the city. Following this success, the US army rolled out the pesticide program across Italy and the belief that DDT would be the ultimate weapon in the battle against the mosquito soon spread. Its weaknesses, however, became apparent after a few years. A major spraying program in Greece at first appeared, like many others, to be a huge success, reducing the incidence of malarial parasites in Greek children from 16 percent down to zero. No sooner had the euphoria of this success died down than the mosquitos started re-appearing and recommenced biting. Laboratory investigation discovered that, through natural selection, the mosquitos had adapted to the

use of DDT and those that had returned were resistant to the pesticide.

8. D. Draining sources of standing water. Cleanliness of body and spirit was deemed by many to be important in the fight against diseases such as Malaria and yellow fever as the role of the mosquito in communicating disease remained unknown for centuries. Quarantine was imposed in some areas as the diseases were thought to be contagious but proved ineffective as those guarding the area were unable to stop the mosquitos getting through. The advocating of sanitation as a means to improve public health was the first success in reducing the incidence of mosquito-borne diseases but it was not the cleanliness itself that proved to be the important factor. The true danger to human populations was brackish water standing in swamps, marshes, barrels and many other vessels. By draining or removing these bodies of water, the authorities would remove the main breeding sites for many mosquitos who carry disease

9. B. Gin and Tonic. “Indian Tonic Water” was developed when it was discovered that the compound Quinine was effective as a prophylactic against malaria. Quinine was added to carbonated water to make the drink, which had a very bitter taste. To make the tonic water more palatable, it was served with gin, adding a sweetness and taking the edge off the bitterness. Modern tonic waters being sold today have their quinine content reduced to less than half the concentration of the original concoction.

Drought and Oaks – What’s a Home Gardener to Do?

by Jan Christopherson, Nevada County Master Gardener

The fourth year of drought in California has increased stress on native oaks, causing many home gardeners to wonder if irrigation is the answer. We’ve had several questions at the Hotline and in emails related to this situation.

The most notable effect of the prolonged drought has been premature browning of the leaves and subsequent leaf drop. Early defoliation conserves water in the tree and ostensibly increases the tree’s chance of survival. However, fewer leaves mean reduced photosynthesis and consequently, less growth and vigor. This can result in increased susceptibility to diseases and insect attacks. Additionally, acorn production and the survival of oak seedlings can potentially be affected by drought. Typically, prematurely dropped leaves will return in the spring, assuming the drought is not too severe and the branches themselves have not experienced a die-back.

Summer irrigation of oaks has traditionally been discouraged, since it can cause fungal diseases and crown rot, particularly if water is applied near the base of the tree. However, research has shown that irrigation can be beneficial and even life-saving if done properly in extended drought conditions. Research supports keeping water at least ten feet from the root crown, or applying it in the outer two-thirds of the root zone, under the “drip line” (outer boundary of the branches). Water should be applied once a month, slowly and deeply, percolating 12” to 18” below the soil surface.

With the possibility of warm and dry weather continuing, home gardeners should take inventory of the health of their native oaks and determine if careful irrigation is warranted.



Have Questions About Oaks?

Go to the UC Davis
Oak Woodland Management Website
http://ucanr.edu/sites/oak_range/
and click on the “Ask an Oak Expert” tab



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- “The Effects of Drought on California Oaks.” http://ucanr.edu/sites/oak_range/Oak_Articles_On_Line/Oaks_and_Climatic_Factors/The_Effects_of_Drought_on_California_Oaks/
- “Summer Irrigation of Established Oak Trees.” http://ucanr.edu/sites/oak_range/Oak_Articles_On_Line/Oaks_and_Landscaping_urban_forestry_Summer_Irrigation_of_Established_Oak_Trees_243/
- “Irrigating Oaks in the Drought.” http://ucanr.edu/sites/oak_range/?start=3&blogasset=33339



Events Calendar

Nevada County Demo Garden
1036 W. Main St., Grass Valley
(on NID Grounds)

Placer County Demo Garden
11477 E. Ave., Auburn
(Senior Garden, DeWitt Center)

October

Saturdays, Oct. 3, 17

8:00 am-Noon

Visit the Placer County Master Gardeners at the Auburn Farmers' Market

Old Town Courthouse Parking Lot

Tuesdays, Oct. 6, 13, 20, 27

8:30 am-1 pm

Visit the Placer County Master Gardeners at Roseville Farmers' Market

Whole Foods Market at Fountains

October 3

10:00 am-noon

Creating Perennial Borders for Sun and Shade

Grass Valley Elks Lodge*

October 10

10:00 am-noon

ABCs of Planting an Orchard

Grass Valley Elks Lodge*

October 31

10:00 am-noon

It's OK, Prune Away

Grass Valley Elks Lodge*

* During inclement weather months, workshops are located indoors at the Elks Club lower level meeting room, 109 S. School Street, Grass Valley

November

November 20-22

Visit Placer County Master Gardeners at the Mandarin Festival

Fri. 11:00 am-5:00 pm

Sat. 9:00 am-5:00 pm

Sun. 10:00 am-4:00 pm

Gold Country Fairgrounds

1273 High St., Auburn

-  Nevada County events in green boxes
-  Placer County events in yellow boxes

Look for 2016 Events to be Posted on our Websites in the New Year:

<http://pcmg.ucanr.org/>
<http://ncmg.ucanr.org/>



Photos by Judy Carroll (top) and Elaine Applebaum (left), Placer County Master Gardeners

About Master Gardeners

Our mission as University of California Master Gardener volunteers is to extend research-based gardening and composting information to the public through various educational outreach methods. We strive to present accurate, impartial information to local gardeners so they have the knowledge to make informed gardening decisions in regard to plant choices, soil fertility, pest management, irrigation practices, and more.

The Master Gardener volunteer program was started in the early 70's at the University of Washington. Farm Advisors became overwhelmed by all the incoming calls from home gardeners and homesteaders so they trained volunteers to answer these questions and the "Master Gardener Program" was born. The first University of California Master Gardener programs began in 1980 in Sacramento and Riverside counties. The Nevada County and Placer County Master Gardener Associations began soon thereafter in 1983.

Over 30 Years of Serving Placer and Nevada Counties

Production Information

The Curious Gardener is published quarterly by the University of California Cooperative Extension Master Gardeners of Placer and Nevada Counties.

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Community Education Specialist: Home Horticulture and Composting Education, Master Gardener Coordinator

Elaine Applebaum, Production

Placer County Master Gardener

Have a Gardening Question?

Call our Hotline

Placer County Residents

530.889.7388

Nevada County Residents

530.273.0919

Master Composter Hotline

530.889.7399

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Online subscriptions are free to residents of Placer and Nevada Counties.

Log on to http://pcmg.ucanr.org/Curious_Gardener_Newsletter/ to sign up for your electronic delivery.

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