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# WORMS IN MY APPLES— NONCHEMICAL CONTROL OF **CODLING MOTHS**

Jacqueline Champa Placer County Master Gardener

All summer you looked forward to your first, fresh-picked apple of the season. Picking a beautiful apple off the tree, the only imperfection is a slight red spot on the skin---somewhat like a blossoming human pimple. Biting into the crisp, juicy apple you notice what appears to be a worm tunnel. Picking more apples, you notice a damp, brown granular substance (frass) protruding from holes in the skin. When you cut an apple, the core contains frass, a mixture of worm feces and food fragments.

The apple damage is caused by the larvae ("worms") of the codling moth, Cydia (Laspeyresia) pomonella, the most serious temperatures exceed 62°F. The male caterpillar pest of apples, pears, and walnuts. Although less common, codling moths also attack plums and other stone fruits.

Knowing when to use the various means of control to protect your fruit and walnuts from codling moths requires an understanding of the insect's life cycle.

During late summer to early fall the codling moth larvae emerge from damaged fruit---after enjoying the opportunity to fully develop within the fruit.

The fact the larvae, which are white to light pink with a brown head, live within the fruit makes it difficult to control and eradicate codling moths.

After emerging from the fruit, the larvae encase themselves in a cocoon, overwintering under bark on tree trunks, in nearby debris, or in any other location that provides a hiding place. In the spring, after pupation inside the cocoon, the adult moths emerge in search of moths of the opposite sex.

The moths which are about ½ to ¾ inch long with mottled gray wings banded with dark, coppery brown at the tip of the wings, spend the daylight hours on tree bark where they are indistinguishable. The moths become active a few hours before and after sunset when codling moths mate with multiple females. Each female will lay 30 to 70 tiny, single, disc-shaped eggs on fruit, nuts, leaves, or spurs.

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As the eggs hatch, the young larvae bore into fruit and nuts where they develop and then leave the fruit to drop from the trees in search of pupations sites. And, so the cycle goes.

The rate of development varies with the weather. More rapid development occurs in warmer weather and climates. If the weather conditions are right for them, two to four generations of codling moths can develop per year.

Because codling moths can be so prolific and are difficult to manage once inside the fruit, it helps to reduce the numbers of successive generations by eliminating as many of the first hatch as possible. Codling moth populations building up generation after generation are especially difficult to get under control with chemical, as well as nonchemical means.

Nonchemical controls include selecting varieties of fruit and nut trees that are less susceptible to the moths, sanitation, mass trapping, trunk banding, and fruit bagging.

Varieties that are less susceptible to codling moth are early maturing apples and pears and late leafing walnuts. Check with your local nursery regarding the availability of early producing apples and pears and late leafing walnuts.

Sanitation is vital if you wish to use nonchemical means to control codling moths. During the winter, remove any props, old fruit, debris, rubbish, and loose bark that provide a hiding place for pupae. Once fruit has set in the spring, check it every week or two for signs of damage. Any fruit showing signs

of damage (small red dots called "stings") or frass-filled holes should be removed and discarded in a manner that will prevent further infestation. Dropped fruit may have larvae in them making it important to pick up and promptly discard dropped fruit throughout the season. Removal before the larvae are old enough to crawl out and begin the next generation will help to reduce the population of the next generation.

Pheromone traps have limited usefulness for codling moth control unless used along with other controls. The usefulness of traps is limited because the traps attract only male moths by mimicking the scent of a female moth. Traps should be hung beginning in mid-March. Check the traps every week or two and replace traps or lure caps as they become full or as directed by the trap manufacturer.

Another nonchemical method of codling moth control is **trunk banding** which traps mature larvae in a band of "tanglefoot", burlap bags or corrugated cardboard as they move down the tree to pupate. "Tanglefoot" is a commercially available, non-pesticide sticky gel that can be applied to tree bands.

Larvae attempting to cross the bands become stuck in the gel, preventing them from reaching the ground to pupate. Banding will control only a small percentage of the larva because they often pupate before being trapped. The trapped larva must be killed by crushing them so they do not emerge as adult moths.

One way to utilize mass trapping is to use a strip of large-core (1/8-inch wide corrugations) corrugated cardboard about 4 inches wide just before larva drop (typically during

May). Place the corrugated side of the cardboard snugly against the tree at the smoothest part of the trunk with the corrugations vertical to the ground. Remove the bands by the end of May, destroying any trapped larvae and pupae before discarding the cardboard. Place new trunk bands in mid-August, removing and discarding them between November and January.

The final nonchemical control method is **bagging** the immature fruit. Although it is time consuming to use, excellent control of the codling moth can be achieved by enclosing each young fruit in a bag right on the tree. Bagging should be done about 4 to 6 weeks after bloom when the fruit is ½ to 1 inch in diameter.

First, thin the fruit to one per cluster. Then, using standard lunch bags cut a 2-inch slit in the bottom fold of each bag. Slip the fruit through the 2-inch slit so it forms a seal around the stem. Staple the open end shut. This will not affect the maturation or quality of the fruit, but may prevent full color development on some varieties.

Although it may be difficult to totally eliminate codling moths from your orchard, with a little effort throughout the year, next fall you should be able to enjoy your apples, pears, and nuts with fewer "worm" incidents.

#### References

**Codling Moth**, December 2005, University of California Pest Notes Publication No. 7412.

Pests of the Garden and Small Farm --- A grower's Guide to Using Less Pesticide, 1998, Mary Louise Flint, UC ANR Publication 3332.

# TIPS ON HARVESTING VEGGIES

Nikki Duncan
Placer County
Master Gardener

The warm weather continues and the garden is producing. When do you harvest and what do you do with the bounty?

Knowing when to harvest your vegetables is as important as knowing how to grow them. Each vegetable has a window of opportunity for harvest. Some vegetables have a long harvest window but others can go from tender to tough and bitter overnight. We all know what happens to zucchini if we are not vigilant in our harvesting.

The biggest is not

necessarily the best.

Counting days to maturity cannot always be relied upon as growth depends on many factors, including temperature and soil fertility, which will vary from year to year. The quality of vegetables does not improve after harvest so learning when to harvest will ensure picking vegetables at proper maturity.

The best way to determine when a vegetable is ready to harvest is from the characteristics of the plant itself. These signs can often be subtle and it takes practice to familiarize yourself with them.

There are lots of good resources available which will give you specific information for each vegetable you are growing. Refer to these, as you will have better success with increased knowledge about the particular characteristics of a plant.

First, try to avoid damaging the plants when harvesting. Use clean, sharp knives or pruners to remove summer squash, cucumbers and other large vegetables. This decreases the chance of disease entering the cut.

Also, harvest vegetables when the plants and veggies are dry. Avoid bruising or damaging the vegetables.

Some vegetables need to be harvested before any frost occurs (most hot season crops such as tomatoes, cucumbers, eggplant, etc), while others need freezing temperatures to complete their ripening (brussel sprouts and parsnips).

Many root crops can be left in the ground through the winter covered with some mulch of hay or leaves. (beets, carrots, rutabagas and turnips)

Some vegetables need to be cured after harvest. This involves exposing the produce to warm, dry air (but not direct sun) so that the outer skin hardens and protects the core from rotting. (onions, potatoes and sweet potatoes).

Sometimes it is difficult to pinpoint the exact time to harvest; melons fall into this category. The general rule is to smell the fruit, to look for the nearest tendril to the melon, and to observe the color change on the part of the melon that it resting on the ground. When it smells sweet, when the tendril is brown and dry and when the part of the fruit resting on the ground goes from white to creamy, it is ready.

A general rule of thumb is to harvest early in the morning. This is particularly important when harvesting leafy greens such as lettuce, spinach, kale or swiss chard. This will protect the greens from undo exposure to sun and wilting.

Many vegetables should be stored only at room temperature. This allows for further ripening and flavor. Make sure the vegetables are not in direct sun as they ripen on the kitchen counter. Placing cucumbers or summer squash in a vented plastic bag helps reduce moisture loss.

Use your fresh vegetables as soon as possible for the best nutrition and optimum quality.

To maintain food safety, wash your produce under running water rather than filling the sink with water and washing a batch at a time. Before and during harvest remember to use clean tools, gloves and work surfaces. Learn about your vegetables and get the best of the best from your hard labors. It is worth it!

#### References:

UC IPM Statewide Program, Agriculture and Natural Resources. See Home and Garden and choose individual vegetable pages. Copyright 2008.

Storing Fresh Fruits and Vegetables for Better Taste. Postharvest Technology Research and Information Center, Department of Pomology, UC Davis.

Guidelines for Harvesting Vegetables, Cornell Cooperative Extension, Chemung County

# STORING YOUR HARVEST

Liz Rees

Nevada County Master Gardener

ooking out into your garden, Lyou pause to wonder, what was I thinking when I decided to grow all of these vegetable plants and all of these fruit trees? Questions keep flashing in your mind. How many recipes are there for zucchini? Why didn't you know that one zucchini plant would have been more than sufficient? How many tomatoes can one family eat without turning red? Do Fava beans really go well with a nice Chianti? What was once a fond hope of abundance just might have turned into a nightmare of what to do with it all!

It is a little late to worry about the number of plants or trees so why not focus on how to store some of this bounty for the non-productive month of winter. An abundant harvest can provide good eating long after the garden is gone if you take some steps to store your harvest.

What you grew this season will guide you in storing your harvest. Which one is the right one? There may be more than one way for every item that your grew, but basically you can:

- Freeze
- Dehydrate
- Can
- Root cellar/Cold storage
- Vacuum pack

No matter what method you use, the quality of the end product will depend on the quality of the starting product. Choose only the best of your crop to store, the rest should be used soon after harvesting.

Freezing is a great method to preserve flavor, texture, appearance, and nutritive value of your crops provided you have sufficient

space in the freezer.

Choose produce carefully since freezing will preserve quality, but it can not improve upon it. Items must be thoroughly washed. Then they are blanched in boiling water, or sometime steam, to slow or stop the enzyme action which causes the vegetables to ripen. The vegetables or fruits must then be rapidly cooled in ice water to stop the cooking process. They are now ready to be packed in containers and put in the freezer.

Many cookbooks will give directions on the preparation for freezing various fruits and vegetables. The Internet is also good source of information about specific instructions for freezing any particular item.

Dehydrating is a method which removes moisture from the vegetable or fruit for long term storage. There are 4 ways to dry fruits, vegetables, herbs, and nuts.

- Sun Drying requires 3 to 4 sunny days at 100 degree temperatures with very low humidity.
- Oven Drying Oven drying is an acceptable method of drying

food, but it is not very energy efficient. Your oven must be able to maintain temperatures below 200 degrees or you must keep the oven door ajar.

- Microwave drying This can be very tricky as food tends to cook while drying. Might not be the best choice.
- Electric Dehydrators These machines are efficient and operate at low temperature needed to maintain nutritive value.

Dried foods should be packed in air tight containers and stored in a cool, dark, dry area. Dependent on storage condition, dried foods could last up to one year. If using an electric dehydrator, check the instruction book for how to prepare the fruits, vegetables or herbs It will also give information on temperatures and drying times.

**Canning** fruits and vegetable has been a staple in crop storage for a very long time.

Basically, canning preserves food by destroying spoilage bacteria with heat and sealing of the container so other microorganism contaminants are kept out.

Methods and equipment for canning may have evolved over time, but the principles are still the same. It is a more involved process than either freezing or drying and more precautions must be taken to insure the safety of the end product.

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Since canning involves heat, the end product tends to be cooked rather than raw. The information here is a summary of the canning process and does not contain complete instructions.

If you choose to store your harvest by canning, please refer to instructions available in books on canning, some cookbooks or detailed information from reliable sources on the Internet for the items to be canned.

The steps in canning are generally as follows. Place the washed and prepared produce into the sterilized jar. Fill with boiling liquid to within one inch of top. Put on sterilized lid and screw band.

Dependent on whether the canned material is low acid or acid food, the jar is place in a boiling water bath or a pressure canner and it is held for the time and temperature stated in recipe for that particular food.

Jars are removed and allowed to cool. After completely cooled, lids are tested for proper sealing and screw bands are removed. Under proper conditions, foods that are canned can be held for long periods of time.

Cold Storage or root cellar storage is great for keeping food supplies at low temperatures and steady humidity. Common before the advent of supermarkets they are still a viable manner to store your harvest. With a root cellar it is possible to have fresh home grown crops well into the winter. Good candidates for root cellars or cold storage are potatoes, carrots, turnips, winter squash, and pumpkins.

Conditions required will vary according to what you will be storing, but can range from cold and damp to warm and dry.

32-40°F and 90-95% relative humidity is good for holding beets, carrots, leeks, turnips, and rutabagas. While 50-60°F and 60-70% humidity is good for holding winter squash and pumpkins. Potatoes are best held at 38-40° and 80-90% relative humidity. Check charts to see what the requirements are for your particular storage needs.

Sometimes separate cellars are required for storing items that can not be stored with others. Examples are potatoes should not be stored with fruit; apples should not be stored with any vegetables.

**Vacuum Packing** is the last method of storage listed. This is somewhat of a hybrid as it is a way of packaging of items prepared by other methods.

Vacuum packing is not a substitution for the heat processing of home canned foods. Nor can vacuum packaging be considered a substitution for the refrigerator or freezer storage of foods that require it. But vacuum packing may extend the storage time of refrigerated foods, dried foods and frozen foods.

Vacuum packing removes air from the contents of a package. When oxygen is present it promotes certain reactions in foods which cause deterioration of quality.

In an almost oxygen-free environment like vacuum packaging produces, the growth of bacteria that causes spoilage is slowed and therefore the quality is maintained longer.

So, this has covered just the highlights of possible ways to store your harvest. But having ways to store the abundance just might keep you from being up all night wondering what to do with it all!

#### Resources

Freezing Vegetables, P. Kendall, http://www.ext.colostate.edu/pubs/foodnut/09330.html

Freezing Fruits and Vegetables, William Schafer and Shirley T. Munson http://www.extension.umn.edu/distribution/ nutrition/dj0555.html

Quality for Keeps: Drying Foods, Food Preservation Team Nutritional Sciences http://extension.missouri.edu/publications/ DisplayPub.aspx?P=GH1562

Home Storage of Fruits and Vegetables in Root Cellars, Barbara Willenberg <a href="http://extension.missouri.edu/publications/DisplayPub.aspx?P=MP562">http://extension.missouri.edu/publications/DisplayPub.aspx?P=MP562</a>

#### Master Food Preservers

In Sacramento and El Dorado Counties, there are "Master Food Preservers", who are volunteers trained in the art and science of preserving food. They give workshops on canning, dehydrating, freezing and more in their respective counties.

In El Dorado County, the program maintains a HOTLINE to answer questions from public:

530-621-5506



# **BULLETIN BOARD**



# Sierra College Community Education Courses

- How to Have a Healthy Garden—October 2, 9am to Noon, Rocklin Campus
- Sustainable Resource
   Management for Your Home,
   Garden and Land, October 23,
   9am to 4pm, Rocklin campus
- Growing Citrus in the Foothills, October 23 and 30, 9am to 1pm, Rocklin campus
- Oak Friendly Landscape, November 6, 9am to Noon, Roseville Gateway

Register here: www.sccommed.org

Come and visit the Nevada County Master Gardener **Demonstration Garden** 

at 1036 W. Main St Just outside of downtown Grass Valley On NID Grounds

#### REMEMBER:

FALL IS THE BEST TIME TO PLANT!!



#### MORE LOCAL CLASSES...

- RAIN GARDENS AND BIOSWALES—FRIDAY OCTOBER 1, 1-3PM AT THE ROOD CENTER IN NEVADA COUNTY.
- ROSEVILLE UTILITY EXPLORATION CENTER GREEN LIVING CLASSES

Check your local nurseries for workshops coming up in October. November and December!



## WESTERN REDBUDS

Pauline Kuklis

Placer County Master Gardener

re you looking for a showy California Native that will bring interest to your landscape all year round?

If so, be sure to check out the beautiful Western Redbud (Cercis occidentalis). Each year they are one of the earliest trees to flower. and are a great way to add color to your landscape.

In early spring you will be awed by magenta-pink clusters of pea shaped flowers which cover the branches for several months.

After the flowers drop, you will enjoy a mass of 2-3 inch dangling heart-shaped leaves throughout the summer.

In early summer the branches are also decorated with magenta seedpods.

Come autumn, the foliage turns bright yellow or red.

Finally, toward late fall the leaves gradually drop, and the bare branches of winter are covered with Western Redbuds are hardy trees interesting reddish brown seedpods which usually hang on until spring.

Given the year-round show they provide, you can understand why Western Redbuds are exceptionally popular ornamental trees!

Western Redbuds can be pruned to a multi-trunk canopy tree, or left as a many-branched shrub. They can reach a mature size of 20 feet tall and 15 feet wide, but often only reach about half that height when growing in the dry California foothills and valley floors.

(or shrubs) that like full sun to light shade. They are quite droughttolerant and prefer limited, deep summer irrigation.

In addition, they are resistant to oak root fungus, and tolerate clay soils with a pH of 5.5 to 8. Once established, they are quite reliable, with the exception of occasional tent caterpillar attacks (control by spraying).

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## It's here!!

The award-winning Placer County Master Gardener Calendar is back for 2011.

This year the focus is on Edible Gardening: Have Your Garden and Eat It Too!

This calendar is available at many local nurseriescall the Master Gardener Hotline for specifics:

530-889-7388

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Pruning should be done during the dormant season or after bloom, and some winter chill is required for them to achieve their best floral display.

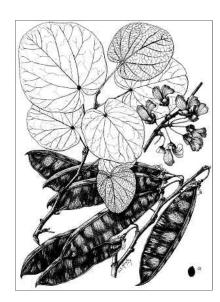
The UC Davis Arboretum features some particularly nice plantings. The Warren G. Roberts Redbud Collection is a grove of Western redbuds, small multi-trunked trees that produce clouds of magentapink blossoms in early spring.

Now that you have learned a bit about Western Redbuds, here are some additional items of interest to add to your trivia base:

- Cercis is a genus of 6-10 species in the subfamily Caesalpinioideae of the pea family Fabaceae – yes, they are a member of the pea family!
- They are great for bird and butterfly gardens and help to attract beneficial insects.
- Cercis species are used as food plants by the larvae of some Lepidoptera species including Mouse Moth.

- Their flowers and fruit are edible! Native Americans roasted seed pods for food. In Mexico, the flowers of redbud are fried and eaten. John Lawson wrote of redbud flowers being used in salads in his History of North Carolina, published in 1708.
- Native Americans also used the leaves for incense and the wood to make bows.
- In addition, young fall redbud branches were highly valued by Native American basket weavers for their wine-red coloring.
- The white inner sapwood of young spring branches is prized as weft wood.
- Redbud has been called the Judas tree because Judas Iscariot, after betraying Christ, was said to have hanged himself on Cercis siliquastrum, a close relative of eastern redbud that grows in Europe and western Asia. The blooms of the tree, originally white, were said to have turned pink with shame or blood.

 Redbud is the state tree of Oklahoma.



#### References:

http://www.ipm.ucdavis.edu/PMG/GARDEN/PLANTS/redbud.html

http://ag.arizona.edu/pima/gardening/aridplants/Cercis occidentalis.html

http://arboretum.ucdavis.edu



# Fall Plant Sale

Did you know that Fall is the best time to plant??

Come and visit us:

## OCTOBER 9, from 9am to Noon

@ Demonstration Garden on NID Grounds (1036 W. Main St.)

We'll have plenty of wonderful plants to choose from!



# FALL 2010 CALENDAR



SATURDAYS, year round, 8 AM – Noon Foothill Farmers' Market, Courthouse parking lot, Auburn SATURDAYS, year round, 10 AM – Noon "Master Gardeners & Friends" Radio Talk, KNCO Radio, 830 AM

#### **OCTOBER**

Friday—Sunday, October 1-3 from 10am-7pm at Gold Country Fairgrounds: *Visit the Placer Master Gardeners at the Auburn Home Show* 

Saturday, October 9 from 9am-Noon at NC Master Gardener Garden (1036 W. Main, GV): FALL PLANT SALE!!!

Saturday, October 9 from 10am-11:30am at Roseville Utility Exploration Center: *Composting 101* 

Sunday, October 10 from 10am-4pm at Boorinakis-Harper Ranch in Auburn : **2010 Farm and Barn Festival—Visit the Placer Master Gardeners at the Ranch!** 

Saturday, October 16 from 10am-Noon at NC Master Gardener Garden (1036 W. Main, GV) : **Establishing Your Home Orchard from A-Z** 

Saturday, October 16 from 10am-Noon at Auburn City Hall in the Rose Room: **Composting 101** 

Saturday, October 23 from 10am-Noon at NC Master Gardener Garden (1036 W. Main, GV): **Shade Plants for the Foothills** 

# **NOVEMBER**

Saturday, November 6 from 10am-Noon at Full Circle Garden at the Rood Center in Nevada County: **Composting Basics** 

Saturday, November 13 from 10am-11:30am at Roseville Utility Exploration Center: *Composting 101* 

Saturday, November 13 from 10am-Noon at NC Master Gardener Garden (1036 W. Main, GV): *Native Conifers* 







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