Trumpet Vine

Knowledge for the Community from Loudoun County Master Gardeners

Summer 2012

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LOUDOUN COUNTY MASTER GARDENER LECTURE SERIES

FREE AND OPEN TO THE PUBLIC

UNLESS NOTED, LECTURES ARE HELD AT THE VIRGINIA COOPERATIVE EXTENSION OFFICE, 30B CATOCTIN CIRCLE SE, LEESBURG, AT 7PM

July 12. *Hydroponic Farming,* Mary Ellen Taylor, Endless Summer Harvest (Offsite, see website for details.)

August 2. *Basic Landscape Design Principles*, Judy Brown, Landscape Architect

Sept. 6. *Understanding Mushrooms*, John Dahlberg, Hidden Hollow Farm, Lovettsville

Oct. 4. *The Chestnut Story*, Catherine Mayes, The American Chestnut Foundation

Nov. 1. *Growing and Planting Trees*, Brian Mayall, Casey Trees

For more information, please visit our web site at loudouncountymastergardeners.org

Visit us on Facebook: Master Gardeners of Loudoun County, Virginia.

Summer in the Garden

If you are a gardener, summer may be the best of times — bountiful harvests, a riot of colorful flowers, shade trees, gentle rains and cool breezes, and the rhythm of nature on full display. Or it may be the worst of times — extreme heat, drought, wilting plants, and an overabundance of bad insects and plant diseases. Which will characterize this summer? We've already experienced a very warm and dry early spring and then much needed rain and cooler temps recently. Whatever the summer brings, the Loudoun County Master Gardeners will be ready to help you manage your garden and landscape.

The Master Gardeners are actively working garden clinics, the Help Desk, children's workshops and community events providing unbiased research-based solutions to horticulture problems. The new class of Master Gardener interns is out in the field under the guidance of tenured MGs after having completed their training earlier this year. Our next training class starts in January 2013. See page 6 for more information.

The demonstration garden at Ida Lee Park is looking fabulous and the MGs have been hosting "Saturdays in the Garden." We are proud that our garden won the 2012 Signatures of Loudoun Design Excellence Program for Public Landscapes presented by the Board of Supervisors on June 5.

Changes have occurred to the MG programs due to the loss of funding for the Urban Horticulturalist position following the Board of Supervisors' budget cuts. Over 15 program teams analyzed their processes to determine what changes were needed to cover the duties of this eliminated position. Some programs have been reprioritized with reduced volunteer hours, response times to the public would take longer, and MG training and the Help Desk have been reformatted. We do anticipate the need to supplement the horticultural expertise as we exceed the current staff's capacity. We are looking for funding support from the public and the business community.

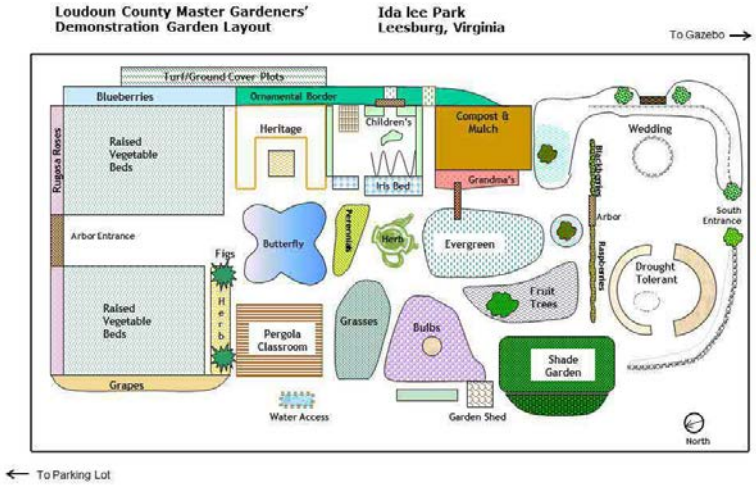
We want to thank all our supporters during this challenging period. The optimistic "can do" attitude of the Loudoun Master Gardeners will enable the program to overcome current challenges and continue this important service to improve the quality of life in Loudoun County.

Alta Jones, President, Loudoun County Master Gardeners

Award winning Demo Garden…come visit and see why!

Our Master Gardeners' Demonstration Garden is a winner in the 2012 Signatures of Loudoun Design Excellence Program for Public Landscapes, awarded by the Design Cabinet of Loudoun Economic Development.

Twenty years in the making, the Loudoun County Master Gardeners Demonstration Garden is a one-third acre urban oasis in Ida Lee Park. It is divided into vegetable, fruit and ornamental gardens, connected by pleasant, meandering pathways and adorned with all season landscape interest. This all Organic Garden is designed to be educational as well as enjoyable, and seems to beckon visitors. It offers a venue for lectures on horticulture, a back drop for wedding pictures, and a site for family picnics or community gatherings. Schools, clubs, and neighbors tour the garden, and it is featured on Loudoun's Farm Tours. On July 4th, hundreds visit as a part of the Ida Lee fireworks celebration held nearby. This Garden is as bountiful as it is beautiful, yearly growing nearly a ton of high quality vegetables, all of which is donated to Interfaith Relief.



Check out our:

Be sure to come by for our Saturdays in the Garden, the first Saturday of the month, June 2nd, July 7th and August 4th from 10AM to noon. Bring your questions about veggies, perennials, pests, diseases or just walk through the garden at your leisure.

Barb Bailey, LCMG (Excerpts from Jim Kelly)

Spring Journal of the Vegetable Garden

2012 started out almost balmy, allowing us to get a little work done early in the Master Gardeners' Demo Garden at Ida Lee. Almost all the beds had cover crops growing to protect the soil from erosion during the winter.

Crimson clover, which has a beautiful flower, red clover, oats and hairy vetch and buckwheat are the crops we grew over the winter. The clovers are legumes, so they form nodules on the roots that 'fix' nitrogen in the soil. We find these crops to be fairly easy to 'turn' in the bed, as all our labor is manual. We learned the hard way that winter rye is not good to plant, unless you have a *very* small bed or a rototiller. They are a mass of roots, which is good for the soil, but hard to turn.

Buckwheat is a summer annual. By last fall, our buckwheat flowered and fell over, making a nice mulch for the bed. The flowers are supposed to be cut off, or cut before they flower, otherwise you'll have buckwheat everywhere. We didn't get it cut, so there are plants through the whole garden now. And they are quite beautiful.

March 13- Opening Day of the Demonstration Garden (DG). A beautiful 70 degrees! Snow and snap peas, traditionally planted on the 17th, St. Patrick's Day, are planted today. In 2011, we had beautiful tall pea vines and no fruit. There was a bountiful harvest in 2010. Let's see what a new year brings.

March 22- was the trainee's class at the DG. We welcomed them with a tour of the veggie garden. 3 hardy souls started their volunteer hours by getting used to the veggie garden.

We planted 38 heads of cabbage on the 22nd. MG Laura Hopkins started and raised a *bunch* of cabbage plants. Like all smart gardeners, she planted extra seeds, in case something happens. We have 4 kinds all under hoops with row cover. This protects them from those pretty little cabbage moths. We also used some wood ash and 'food grade' Diatomaceous earth around the base of the plants to deter the cabbage maggots.

March 27- one of my favorite planting days…Potatoes! We planted 4 kinds. First asparagus harvested this day.

A lot of the lettuces and spinach didn't germinate and are being replanted. It was suggested that we try broadcasting the spinach seeds instead of planting them in a row. Tried it with 2 kinds, and they grew like crazy! I think we might try that with collards and mustard, as the majority of the seeds (with a replant) didn't germinate.

When it came to turning the beds, composting and fertilizing, we paid attention to what was being planted in the beds. Some plants, like root crops, radishes, beets, onions, turnips and carrots, don't like a lot of nitrogen. In those beds, we used more compost than fertilizer. We also have a bucket of compost tea ready to use. Burpee, where we got our onion sets this year, suggested we soak the sets for ½ hour before planting. We didn't have any made at that point, so we used a LOT of compost in planting and watered well.

April 3- planted Swiss chard, onions, beets.

April 10- 1st potato sprout is up. It is called Nicola. Planted Yukon Gold seed taters in the smaller of our 2 grow pots.

We continue to water (with a watering can) onions, lettuces and the cold frame plants, with compost tea.

This is our 1st season with the cold frame. We've grown a few marigolds, some lovely red romaine lettuce, ½ of which we transplanted into the garden. We also used it to store and harden off some potted seedlings. Now, calendula seeds are up along with cleome and nasturtium.

May 1- Sunny and 75 degrees. We had our 3 tomato 'water teepees' in place in the tomato bed for a week, warming the soil for early planting. Planted 3 and kept the teepees on until Mother's Day. We plant tomatoes in a trench, laying the seedling sideways in the trench and gently working the plant and the soil so the plant stands fairly straight. This gives more space to grow and more stem to grow roots from.

May 3- Our 1st ripe strawberry! This bed of 'Earliglow' hasn't been given a lot of care the last few years. Last year we laid on several layers of compost over the season. We mulched with pine straw and regular straw for the winter. It seems to have made a big difference. Plants and fruits are bigger and healthier this season. Yum!

May 17- 65-70 degrees and sunny. Good day to plant tomatoes. We put 9 on the trellis and 3 in cages. The cages are tall reinforced wire. We stake them in, because not only can the tomatoes get huge, the wind sometimes barrels through the garden, actually pulling 30' of row cover off the hoops over the cabbage.

Also on the 17th we planted 36 pepper plants in metallic mulch positioned over the bed. Metallic, or silver, mulch is good for peppers. The reflection on the bottom of the pepper increases their yield, and also confuses the pesky insects. It seems to work. We've had good luck with it. We are also going to use it on the cucumber bed.

May 24- a very exciting day! 9 heads of cabbage, and a *very* large Ikea shopping bag (thanks Jan) full of multicolored lettuces. We harvested 49 lbs. from cabbage and lettuce.

May 29- our first harvest of beets. I really thought they weren't going to form roots. After a good several days of rain, the beet greens got really full and healthy looking, and there was a gorgeous 'Touchstone Gold' beet.

Tomorrow is the last day of May. For weeks I wondered if anything was going to germinate. Then, here and there, little seedlings started popping up. Then it was, "is any of this going to grow?". Now everything is growing and looking good. The next crops to be planted can be the most frustrating. And that's because of the BUGS! Beans, cucumbers, summer/winter squash. We will plant 'trap' crops (plants positioned away from main bed) to help stop the influx of bugs on our precious crops. Baby Blue Hubbard will be in a container for the winter and a zucchini for the summer. A sacrificial plant.

We will have 2 pole bean teepees and will try manual disposal of bugs. Squishing bad bugs or dropping them in a pail of soapy water. We will also have plantings of bush beans that we will keep under row cover. We have been fighting bean beetles for several years, sometimes with no harvest. So bush beans under cover should give us harvests.

We ate the 1st of the blueberries on the 29th. Perks! The bushes are full of berries. Howard Moody, an MGV intern, constructed a very clever frame with bird netting over it to protect the blueberries, and you can pull up the netting and walk the whole row to pick berries! We are a clever bunch!

On the 29th we harvested 58 lbs, with 10 heads of cabbage. I get so excited over what we harvest. The folks at Interfaith roll their eyes and smile.

And the peas are popping out all over the plants. The Square Foot Garden is chock a block full of peas, kale, carrots, lettuce, a determinate tomato (refers to the plant's habit of growing to a certain size, setting fruit, and then declining), potatoes, herbs and I'm sure I'm missing something. Denise Palmer takes special care of that garden, including crop rotation.

We have a great group of gardeners that come through the veggie area. There is always something to learn from somebody. It's a Teaching/Learning Garden.

Normalee Martin, Master Gardener

Fighting Summer Pests in the Sustainable Vegetable Garden

Do you find yourself identifying with the song "Suddenly Last Summer," remembering when pests munched their way through last year's vegetable garden? Pests are a natural part of growing vegetables, so thought should be given beforehand on coping strategies to minimize pesticide use. Sustainable gardeners embrace the concept that not all vegetables will be market perfect and some loss is expected.

The first line of defense for summer pest control is to dissuade pests from finding and/or landing on your crops in the first place. Using a floating row cover or "summer insect barrier" is an excellent way to keep pests from landing on your crops and will help nurture small growing plants like squash, cucumbers, melons, snap beans, peppers and tomatoes until they get bigger. Some pests controlled this way include cucumber beetles, squash bugs, aphids, stink bugs and Mexican bean beetles. A row cover will also help mitigate damage from rabbits, deer, birds and groundhogs.

It is typically made from polyester and will "float" on the top of bigger plants or is used with wire hoops for smaller plants. Installation should take place immediately upon planting so pests are not trapped underneath wreaking even more havoc. You may have to remove one side of the cover occasionally to water unless you have an irrigation system underneath.

As the plants get bigger, you'd need to adjust the row cover to allow more room for growing foliage. When blossoms of cucumber, melon or squash appear it is time to remove the row cover so plants can be pollinated. Bush beans, tomatoes, peppers and eggplant are all self pollinated so removal is not necessary. Floating row covers are available from a number of online retailers, but make sure what you buy is marked for summer use. Purchase garden staples or have available other heavy and/or long objects to make sure the edges of the row cover are tightly secured to the bed all the way around.

Another defense strategy is to have companion plantings in strips around your garden and liberally among your vegetable plants to draw in beneficial insects, many of which will help control the bad insects. In addition, companion plants may help "hide" your vegetables from pests. Planting small-flowered plants such as dill, bronze fennel, coneflower, borage, marigold, sweet alyssum, cosmos or yarrow in addition to French marigolds, nasturtiums, calendula and different herbs will draw in beneficials to help you control pests.

Do you always have a problem with the same pests year after year? Consider planting a "trap crop" of your vegetable 2 weeks prior to planting your main crop. Pests will first find the trap crop and be content with the pickings for awhile. Remember to remove and dispose of this trap crop when it becomes infested so insects do not find your main crop. This strategy is helpful for bush beans, cucumbers and squash.

Although handpicking insects may sound like a tedious task (*okay it is*), it is a big part of a sustainable garden. Drop insects in soapy water in the early morning and remember to remove eggs from the underside of the leaves by rubbing them. Place boards under squash vines to trap squash bugs. Remove the bugs early in the morning and drop in soapy water. Since both beneficial and bad insects hang out in the garden, have an idea of what's considered bad or good by reviewing pests of your favorite vegetable online. *Perhaps these tasks could be assigned to a bored out-of-school child who might find this a stimulating summer endeavor.*

Weeding can be equally tedious and requires some time to do, but you will be rewarded for the time spent as pests will not be hanging around waiting for the good stuff. In addition, without competition the vegetables will have more nutrients available for them.

Eventually you may feel you need to use pesticides to control what ails your vegetables. While many "natural" potions are readily available in the marketplace for fighting pests sustainably, always remember that chemicals are a last resort whether they are synthetic or organic. Even "organic" chemical controls can be toxic and should be used with caution, carefully following label instructions. Identify "certified organic" pest control products by looking for the "**OMRI**" certification on the front or back label. Read label instructions carefully and make sure it is listed for the particular pest you are trying to control. Pay attention to restrictions on when it can be used; avoid use when beneficial insects are active, usually mid-morning.

A very good reference website for more information concerning pests along with other questions concerning vegetables is **http://growit.umd.edu/.**

Denise Palmer, Master Gardener

Join the 2013 Master Gardener Training Class

Do you love your lavender? Does gardening make you grin? Do sunflowers make you smile? Are you pleased with your perennials? Do you find trees tantalizing? If so, you would make a magnificent master gardener!

We are always looking for enthusiastic gardeners and prospective gardeners to join the Loudoun County Master Gardeners. You needn't be a gardening expert. We have an excellent training program.

Our next class begins January 29, 2013. Plan to attend an open house and information session November 8, 2012 at 7PM, 30 Catoctin Circle SE, Suite B, Leesburg, VA. For more information visit http://www.loudouncountymastergardeners.org/becomeanmg.htm or contact us at training@loudouncountymastergardeners.org.

Getting Ready to Preserve the Harvest

After all of the hard work of soil preparation, tilling, planting, weeding and harvesting, there is still another job left to do, preserving the harvest. Naturally, we want to get as much produce out of our garden as possible and make it last as long as possible. In this article, we will discuss methods for preserving the most food value and flavor as possible using tried and true techniques. This article will focus on the most popular and successful methods of food preservation, canning and freezing.

Before beginning the process of preserving your harvest, there are many decisions that need to be considered and choices made. For many people, both methods have value and can be considered if the necessary resources are available. So, let's consider first the fundamental nature, costs, risks and benefits of each method.

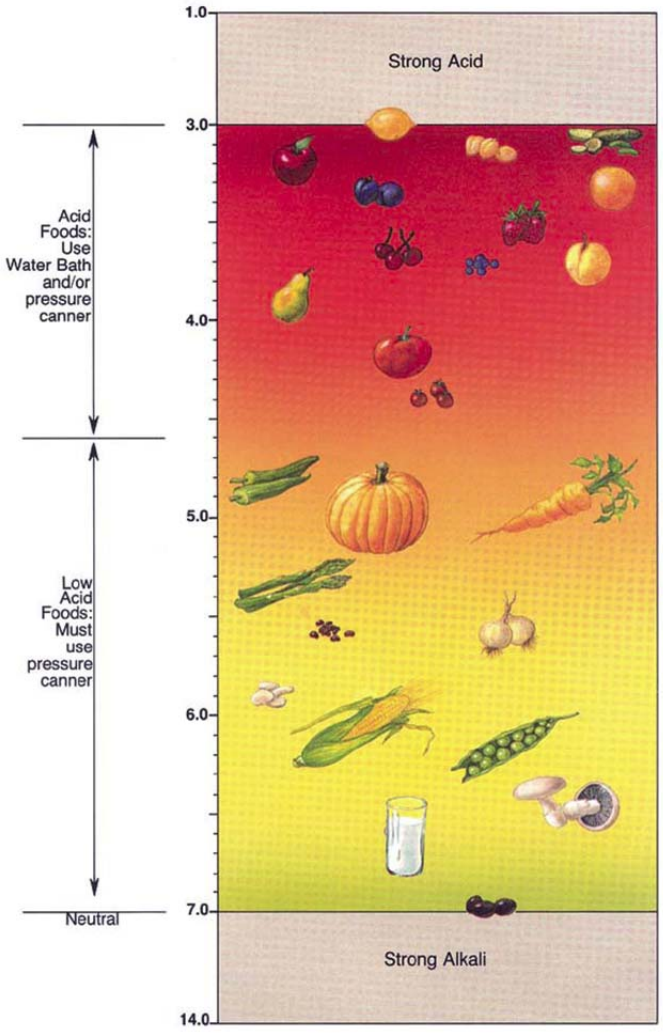


Figure 1: Canning Chart

Home freezing is a relatively modern technology made possible by the availability of larger single purpose home freezers. Many fresh fruits and vegetable are well suited to freezing and the process for preparing, packaging and freezing is relatively quick and easy. To be prepared for freezing, we need a freezer, suitable freezing containers, sharp knives for trimming and cutting the food to suitable sizes for freezing. Some vegetables require scalding prior to packaging and freezing, so a kettle and colander will be necessary. When properly prepared and processed, frozen fruits and vegetables retain much of the natural color, flavor and nutritional value; however, frozen fruits and vegetables have a shorter lifespan when frozen then when canned. There are also the added risks of a power failure or freezer breakdown.

Home canning has a much older origin. Napoleon Bonaparte is believed to have said that "an army travels on its stomach." Canning, in early tin cans, was developed to provide food for his armies. Tools and techniques for preserving food at home, using glass jars, have been developed over a range of experience and time. Today, we use either pressure canners or boiling water baths to preserve food in mason jars with rubber sealed metal lids held down by the vacuum created in the canning process. Home canned fruits and vegetables have a much longer shelf life than frozen foods and do not require special storage conditions. Ideal storage for canned goods is in a cool location with low light, such as a basement room. Since higher temperatures and longer preparation times are used, some fruits and vegetables may lose color, change in

flavor and may even suffer a slight though insignificant loss of nutritional value. If the jars and seals aren't perfectly clean or if correct temperatures are not maintained during processing, spoilage may occur.

Currently, only two methods of home canning are recommended by the United States Department of Agriculture (USDA), these are hot water bath and pressure canning. The criteria used to determine which method to use is based on food acidity. The canning chart, Figure 1, can be used to make the determination. Modern hybridization of fruits and vegetables has produced varieties that are lower in acid and may not be successfully canned using hot water baths. In some cases, lemon juice may be added to lower the Ph. In general, we recommend the use of a pressure canner to be safe.

The major decisions that have to be made revolve around what you intend to preserve and how you will preserve it. Most likely the garden has already been planned, the crops are planted and beginning to prosper. So now it is time to decide how the family likes to have their food prepared. Does Grandma's green bean casserole work better with canned, frozen or fresh green beans? Who likes pickled beets? Can we freeze the blackberries or should we make jam? Do we have a freezer? Do we want to buy a freezer? How much room is in the freezer? What about a storage space with shelves for the canned goods? Do we have or need a water bath canner or a pressure canner? How many jars will we need? Right, these questions seem overwhelming but they are not unanswerable.

The major expense for freezing food is, of course the freezer. Freezers come in two types, the chest and the upright freezer. Chest freezers hold the cold more efficiently but require more floor space. Upright freezers take less floor space and are easier to reach into, but the cold will spill out when the door is open. Freezer sizes range from as small as 5 cubic feet to 20 cubic feet. The prices range from $150 to $1000 or more. This is a serious decision and may require significant thought and budget considerations. Freezer containers are quite inexpensive and reusable. A family can use either shaped plastic containers with snap on or screw on lids or zipper lock style plastic bags. Never use glass, because, as water freezes, it will expand and break the glass.

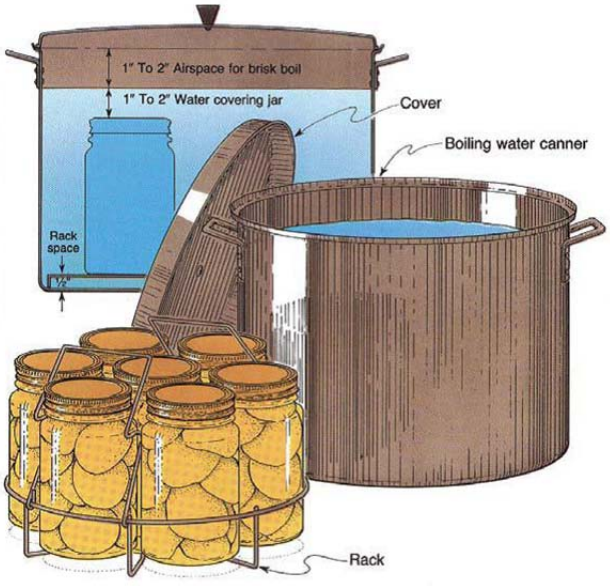


Figure 2: Boiling Water Canner

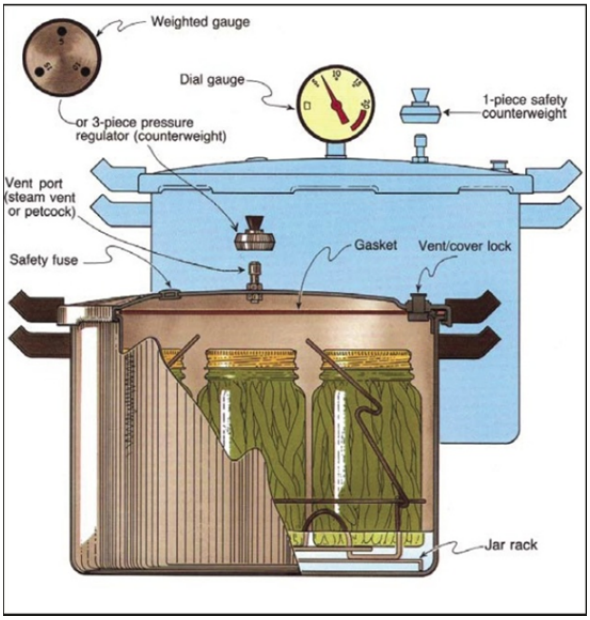


Figure 3: Pressure Canner

The big expenses for canning will be the canner and the canning jars. A boiling water bath kettle (Figure 2) with basket sells for about $20. A pressure canner (Figure 3) will go for as much as $75. The pressure canner is a far more expensive investment but it can be used in both modes quite successfully. The boiling water bath kettle is useful for food preparation in either mode and may be a useful investment no matter which method is chosen.

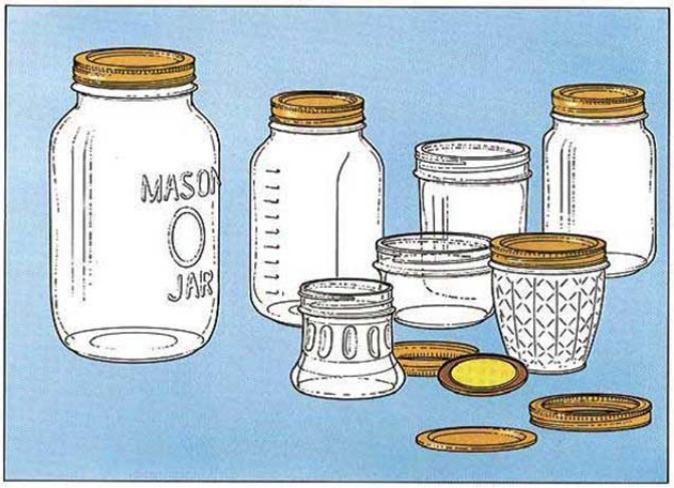


Figure 4: Canning Jars

Canning jars (Figure 4) can be obtained through many sources. Choose the types and sizes of jars based on the produce or food to be canned and on how the family will use the processed food. A case of 12 jars with seals and bands will cost from $8 to $20 dollars depending on the size and type of jar. Always use Mason style canning jars labeled as such. Never attempt to save money by reusing any other type of jar. Replacement seals cost from $4 to $5. Never attempt to reuse a seal. Once a seal is used, dispose of it. The bands are reusable but should be replaced if corrosion develops.

Some additional items are also quite useful for both methods of food preservation. Helpful items for canning are a funnel, jar lifter, tongs, and jar wrench. For both freezing and canning a colander, sieve, food mill and a large kettle are useful.

After all of these considerations, the entire effort will seem daunting but not impossible. Start small and build up from there for best results.

The best resource for canning information is the USDA. They maintain a special website, associated with the University of Georgia, to provide advice for all forms of food preservation called The National Center for Home Food Preservation (http://nchfp.uga.edu).

If the decision is made to use a pressure canner, then consideration must be given to proper maintenance. The pressure gauge, safety plug and gasket should be inspected annually if the cooker is used heavily. The nearest Northern Virginia resource for pressure canner testing is the Frederick County office of Virginia Cooperative Extension (http://offices.ext.vt.edu/frederick/index.html).

David Sheckler, Master Gardener

Did you know…….

- The tomato has nearly 7,000 more genes than humans.
- The strawberry is the only fruit with seeds on the outside.
- Do not pick hydrangea until the petals feel papery. If you pick them too early, when the petals feel velvety, they will wilt.

The Grazier's Lawn—a more holistic approach

By Troy "The Grass Whisperer" Bishopp

During the administration of President Woodrow Wilson, First Lady Edith Wilson grazed her sheep on the White House lawn to cut the cost of grounds keeping.

In the Disney film, *Beauty and the Beast*, Mrs. Potts sings *A Tale as Old as Time.*

To me this refrain; *a tale as old as time*, also describes people's fixation with maintaining a socially acceptable manicured lawn with beastly fuel-sucking equipment, hired grass-perts and a slew of scientifically proven chemicals, fertilizers and the latest and greatest seeds. This economic, environmental and social saga is unfolding right now in watersheds all over the country.

In the Chesapeake Bay Watershed alone, according to USGS Research Geographer, Peter Claggett, lawns and turf grass are now the largest crop grown in the Chesapeake Bay watershed – totaling more than 3.8 million acres covering a staggering 9.5% of the watershed's total land area. Bay turf cover now exceeds total pasture cover (7.7%), hay/alfalfa acres (7.4%) and the acreage of row crops (9.2% - corn, soybean, wheat) grown in the Chesapeake Bay watershed.

Consider the following factoids by the Chesapeake Stormwater Network in their fascinating 2010 report: *http://chesapeakestormwater.net/2012/03/technical-bulletin-no-8-the-clipping-point/*

-- The best estimate for how much nitrogen fertilizer is applied to lawns in the Bay watershed is nearly 215 million pounds per year. This is enough nitrogen to grow nearly 2 million acres of corn.

-- About 19 million pounds of pesticide active ingredients are used each year (mostly herbicides to kill otherwise fine-looking "weeds"). These pesticides are reaching local streams and rivers. According to USGS monitoring data, one or more pesticides were detected in 99% of urban streams, and one out of every five samples exceeded water quality standards to protect aquatic life.

-- Summer lawn irrigation is calculated to suck nearly 7875 cubic feet per second (cfs) of river flow to Bay during the summer months. To put this amount of water consumption in perspective, it is roughly five times the combined summer flow of the Choptank, James, Monocacy, Pataspsco, Pamunkey, Patuxent and Rappahanock rivers in an average year.

-- Our compacted lawns produce a lot of extra runoff to the Bay. Our rough calculations suggest that it produces an extra storm runoff flow of 1244 cubic feet per second each day to the Chesapeake Bay.

-- Lawn/garden equipment is recognized as the second leading emitter of smog precursors in Maryland in the summer months, and is just a few percentage points behind cars and truck emissions.

The out-of-pocket cost to establish and maintain the Chesapeake Bay watershed grass crop is astonishing – nearly 5 billion dollars per year, which does not even include our free labor on the weekends (equivalent to 61,000 full time jobs). An estimated 6.1 million "grass farmers" and 50,000 lawn care workers exist in the watershed who collectively spend more than $600 million for fertilizers and chemicals alone.

The most eye-opening "clipping point" to me, is these millions of sod lovers may have the same environmental impact as real farmers but aren't producing any food.

May I be so bold as to suggest these 3.8 million acres of carbon sinks could be a huge opportunity for the watershed with a little common sense and some holistic lawn care planning? After all, concrete and blacktop don't sequester very much rainfall or create organic matter.

I look at my piece of lawn as an extension of my pasture. I want my sward to be diverse, biologically healthy, able to drink up and hold moisture, soft on the feet and not cost much to maintain. Being from the country, I tend to see the beauty of a healthy lawn by how many birds I seem to attract to feast on the plump red wigglers. It's nothing to see Bluebirds, Robins, Wrens and rabbits frolicking together like school kids in my sea of green.

To get this utopian vista, I have a simple recipe: Leave a taller residual when mowing and leave the clippings. When it gets hot, let the plants rest and get off the darn mower and go fishing with the kids, and stockpile your grass before frost to put energy in the roots for next season. It's also not a bad idea to "read your lawn" to see how fast moisture soaks in, count your worm holes and measure your litter index in building soil organic matter. This monitoring helps me to know if I need to apply anything in creating the sustainable lawn I want.

I have to balance this holistic vision with my lawn-mowing father. Mowing gives him joy and I would hate to deny him the relaxation of putting on his favorite hat and getting away from his desk to shear off the green tips of my fancy. I only ask him, (and keep reminding him) to raise the cutter bar when he harvests my lawn for worm food and point the discharge away from our landscaping.

I want a healthy lawn because it's not out of the question to use it to generate food, since we humans don't assimilate the grass and clovers as well as a chicken, sheep or a cow would. In fact, if we treated our little green friends and soil microbes to the economic engine of a chicken tractor mower we may not need all the inputs we can't eat. Not to mention, Chem-Lawn trucks can't birth any offspring.

There is a scene I continue to dream would happen. When the Food Network stars go to First Lady, Michelle Obama's garden to harvest the veggies, they would also go to the Whitehouse lawn to harvest some eggs from the pastured poultry and milk the family D.C. cow to make some fresh presidential mozzarella. The landscapers would be moving sheep and beefers with portable fences generating positive media by saving the country money, growing local food, building biological life in the soil and showing America lawns can be more than just a patch of green concrete.

There is a line by James Dent that sums up the grass whisperer's feeling on this subject; "A perfect summer day is when the sun is shining, the breeze is blowing, the birds are singing, and the lawn mower is broken."
Published in Lancaster Farming 5/8/2011

Reprinted with permission from The Grass Whisperer http://www.thegrasswhisperer.com/content/11272

New Summer Choices

Here's a couple new introductions for this summer, hope you see something that intrigues.

Sweet Caroline Bewitched Purple - *Ipomoea batatas*
Sweet Potato Vine is a great foliage component plant in combinations with excellent heat tolerance and vigor and Sweet Caroline is no different than the rest of the group. I especially love the coloring of the veins. Sweet Caroline supposedly doesn't get quite as overgrown as the others, with resources quoting a max. spread of 2', but I would take a cautious approach with that and plant with plenty of space and combine accordingly. Sweet Caroline is described as having a mounding habit vs. a trailing.

'Caramel' Heuchera villosa - I have found Heucheras fascinating for several years now, the foliage colors that they have just amazes me. 'Caramel' has pink flowers in the spring but the foliage is the reason to plant it. It attracts hummingbirds and resists deer, Heucheras are considered an easy plant and are native to North America. Size is about 10 inches tall and spreading 16 inches, can handle partial sun.

Superbells Cherry Star *Calibracho*a - Wow! That's what I said when I came across this beauty. Just look at those colors. And it trails up to 4 feet! Can't you just see this cascading over the sides of a white window box? No deadheading needed for this one and it can take the heat and is fairly drought tolerant. Add a couple of the foliage plants listed here and boom – your containers are done!

Archangel Angelonia Series - I am a sucker for purple/blue in the garden and I just love this. The Archangel series offers one of the largest of Angelonia flowers - featuring four vibrant colors: Purple *(shown),* Pink, Raspberry, and White. These plants thrive in extreme heat, can take high humidity, and stand up to drought. Plant Archangel angelonia in mass in the landscape for a sweep of rich color. Or tuck plants into containers and window boxes as bright fillers with mixed plantings. These annuals bloom all summer, right up to frost. 12-14 inches tall, 10-12 inches wide.

Kauai Series Wishbone Flower - New for 2012, the Kauai series torenias are more compact, fast growing and better-branched plants. There are six varieties in the Kauai series: 'Burgundy', 'Deep Blue', 'Magenta', 'Lemon Drop', 'White', and 'Rose'. The 8-inch-tall plants look like miniature gloxinias. Their deep petal color contrasts with their white-yellow throats to make these beauties standouts in beds and containers. Torenias can also take our heat and humidity. Partial sun and well drained soil.

Royal Hawaiian 'Black Coral' Elephant Ears - Can we say bold? Looking for a tropical feel? Black Coral should do it! Big leaves with gorgeous dark foliage, 'Black Coral' will add mystery and excitement to your garden, with it's elegant, glossy leaves and electric blue veins. It has a tidy clumping growth habit, so it's ideal to use in mass plantings or containers. Bring the bulb indoors over winter and plant it again in spring. Reaches 4 feet tall and 3 feet wide – full sun to partial shade.

'Sunny Side Up' Pokeweed — yes, that says Pokeweed! Imagine my surprise in doing research for this article when I came upon this offering! Below is the description from Plant Delights Nursery in NC. Tony Avent is well know in the business as offering unusual plants and this definitely qualifies in my book — and can you imagine what it would look like paired with the Black Coral? A solid-gold selection for your garden, 'Sunny Side Up' offers height and color. Also called pokeberry, this tall, leafy wonder is a North American native that deserves a place in your sunny or partially shaded garden. 'Sunny Side Up' bears bright gold leaves that sprout from red stalks. In late summer, it bears poisonous purple berries. Plant this 5- to 6-foot-tall beauty in the back of a border in full sun, where the foliage color will be in its full golden glory." **Source:** plantdelights.com
Note: All parts of this plant are poisonous if eaten raw; young shoots and berries have been consumed if specially prepared first.

Coleus Under the Sea™ Bone Fish - how fun is this! My dad loves coleus and I could never understand why until a couple of years ago when I started growing some of the Kong series. And now with this new series Under the Sea…..wow! You need to go online and check out the whole series and I don't have enough room to show them all here. Fun, fun, fun. Upright, mounded habit for Bone Fish – coleus are not drought tolerant and can handle shade.

Becky Phillips, Master Gardener

Perennials Need Pruning Too – A Summer Revival

Home gardens, big or small, most likely have a mix of annuals, perennials, a shrub or two, or perhaps a tree. Trees and shrubs provide the year-in-year-out foundation for the garden, while annuals are widely known as workhorses of the garden for non-stop show of blooms from spring to fall, at least for that gardening year.

And then there are the *herbaceous perennials*. We want them in our garden for their interesting diversity and beauty, and because they come back year after year. They may disappear at some point, but as sure as seasons change, they will reappear. Perennials blooming is like a symphony, ebbing and flowing at intervals with varying intensity and a surprise here and there. We are left wanting more.

If only we could enjoy the attractive displays of our perennials longer, with either flowers or foliage keeping their place in the garden longer than a few weeks of fleeting display. Yes, it is possible! Think pruning. Pruning is not just for woody shrubs and trees. Pruning, in general, revitalizes plants. Pruning, more specifically, can extend the pleasing display of herbaceous perennials in the garden.

Pruning can mean cutting back, shearing, thinning, deadheading, pinching, or disbudding. Different perennials will have specific pruning needs, and it is best to know their growth habits for the proper pruning technique. But some methods, such as deadheading and simple grooming, apply to most and would make a good pruning start.

- Prune perennials that have gotten too tall and floppy instead of staking them. By mid-summer, perennials that have shot up during the growth spurts of spring can look awkward and unattractive.
  How to prune? Cut back to about half, and just above where flower buds are starting to form. This may delay the flower display, but many perennials will put out side shoots from cut stems, making the plant bushier than tall and floppy and with more blooms.

- Prune perennials that have finished their display to encourage a rebloom later in the season. The second blooming may not be as striking as the first flush, but it extends the display and keeps the garden filled.
  How to prune? The most common practice is deadheading. Simply pinch out or cut the spent blooms to discourage seed-formation and encourage new flower buds. For dense perennials with fine foliage and small flowers, shear off the top after the first bloom. New growth will follow, including more flower buds. Always snip right above a newly forming bud so you don't leave stubs.

- Prune perennials that have started looking sparse and scraggly to groom them. Blooms may no longer be expected, but some perennials have foliage that can be revived and remain attractive through season's end.
  How to prune? Remove dead or damaged leaves and stems, or cut back down to the basal foliage (foliage at the base of the plant) for fresh growth.

Maria Daniels, Master Gardener Intern

Our Bug-Eat-Bug World

As I write this article, our organic gardens are abuzz with activity, and it is a life and death struggle between predators and prey. It is the world's best known form of organic pest control, and rarely do we get a glimpse of it. Our gardens are teeming with "beneficial insects", the bugs that eat other bugs, patrolling our landscape in pursuit of their next meal. Beneficial insects attack and destroy only insects; they are harmless to people, plants, and pets.

Few insects are actually pests; of all insect species, over 97% of those in our landscape are innocent bystanders. Biologists explain that it is easy to dismiss the bugs of the world, but science is teaching us that we depend on their very existence for our own survival. By providing a welcoming habitat you will encourage nature's insect helpers to maintain a pest free landscape where pesticides are unneeded, and balance is respected. By improving the diversity of plants in your backyard you can ensure your landscape is not only more attractive, but also meets a variety of beneficial insect needs.

Below, I have shared a few of my favorite Beneficial Bugs.

Ground Beetles (Coleoptera)

Most of the 2,500 species are nocturnal, shiny brown, black, or blue-black insects ranging in size from ¼ to over 1 inch long. They have prominent jaws used to kill caterpillars (including armyworms, cutworms, and grubs) and other insects, as well as small snails and slugs. Some are important consumers of weed seeds. Both adults and larvae are predators. Adults can live for 2 – 4 years.

Lady Beetles (Coleoptera)

Lady Beetle Larvae

Adults of the nearly 200 species found in North America are around ¼ inch long having orange or red bodies with black spots (but not always). The eggs hatch into spiny, black alligator-looking larvae, flecked with yellow or red. Both the larvae and adult lady beetles are voracious predators that can eat hundreds of aphids in their lifetime. They also eat insect eggs, mealybugs, soft-bodied insects, and mites. Flowering, pollen-producing plants in the landscape attract this beneficial.

Lady Beetle

Predatory Insects (Hemiptera)

Wheel-bug nymph

This group contains many predators including the wheel bug, big-eyed bug, assassin bugs, damsel bug, minute pirate bug, and predatory stink bug. Their diets consist of aphids, caterpillars, mites, plant bugs, and insect eggs. These predatory bugs also feed on nectar and pollen.

Wheel-bug

Lacewings (Neuroptera)

Green lacewing larvae are called "aphid lions", and for good reason; they attack and consume large numbers of aphids, mites, lace bugs, and other small insects. They measure ½ inch long, look alligator-like, and have hooked jaws.

Spiders (Araneae)

All of the roughly 3,000 species of North American spiders are predators, and most feed on insects caught in a web. Others, such as jumping spiders, crab spiders, and wolf spiders, are active hunters. A recent study indicated that spiders are often the most abundant predators, as a group, on a wide range of plant material in the home landscape.

Hover Flies (aka Syrphid Flies or Flower Flies) (Diptera)

These non-biting and non-stinging flies closely resemble wasps and bees, with a yellow abdomen encircled by brown or black stripes. The legless larvae, sometimes mistaken for tiny slugs, are pale green, clear, or yellow and are usually found in the midst of aphid colonies. They also consume mealybugs and small caterpillars. The adults hover like a hummingbird, as they feed from flowers.

Parasitic Wasps (Hymenoptera)

This is an important, but poorly understood group. While some can be as long as 1½ inches (the cicada killer), most parasitic wasps are extremely small, and lay their eggs inside the insect host. A swollen aphid has probably been attacked by a parasitic wasp. Have you ever seen a hornworm with what appears to have rice stuck to it? These are the wasp pupae. Don't crush the caterpillar, but place it in a safe location to die, as the pupae emerge.

Kick back and enjoy the natural pest control provided by this amazing balance among the "good bugs" and the "bad bugs".

Karen Olgren, Master Gardener

Termites and Carpenter Ants – How to Tell the Difference

Ants - they're everywhere, especially this time of year. It's always annoying to see them crawling across the kitchen counter, but what if they aren't plain old ants, but carpenter ants, or something worse, like termites? Could they be doing real damage to our homes?

Now don't panic. Termites and ants look quite different, and carpenter ants can be readily distinguished from other types of ants; you just need to know their unique characteristics to be able to identify them.

In this article, we'll look at termites, how they differ from carpenter ants and the clues that both leave behind.

Termites

There are five different types of termites found in Virginia. The most common one is the Eastern Subterranean Termite, Reticultermes flavipes. All are subterranean; they live in the ground up to twenty feet below the soil surface to protect the nest from extreme weather conditions. Unless they are swarming, termites are always hidden from our view either beneath the surface of the soil, inside wood, or in earthen (mud) tubes they construct.

On the left is a picture of a mud tube. Notice that it is about the diameter of a pencil.

As for the insects themselves, there are four castes of termites: Worker, Soldier, Male, and Queen. Each caste looks different from the others. If you uncover hidden termites, they will most likely be Workers and Soldiers which are both milky white and soft-bodied, wingless and sightless, up to ¼ inch long. Only the Males and Queens have eyes and dark bodies. All castes have straight beadlike antenna, and are broad waisted. Furthermore, termite Queens "stretch" every time they molt, adding another set of ovaries; therefore, Queens can be up to ¾ inch long.

Termite Worker

Termite Soldier

Termite male swarmers

Termite Queen

You are most likely to see termites when the winged swarming males and Queens emerge from their colony. When they are done swarming, they lose their wings. Often people mistake swarmers for flying ants, so next let's look at carpenter ant swarmers so we can identify their differences.

Carpenter Ants

Eastern Carpenter Ants (*Camponotus pennsylvanicus*) are found in Virginia. Each colony has one queen. Mature colonies contain 2000+ ants and can have multiple "satellite" colonies of 500+ ants each. Carpenter ants nest in moist wood including rotting trees, tree roots, tree stumps, and logs or boards lying on or buried in the ground. They can also nest in moist or decayed wood inside buildings. A "satellite"

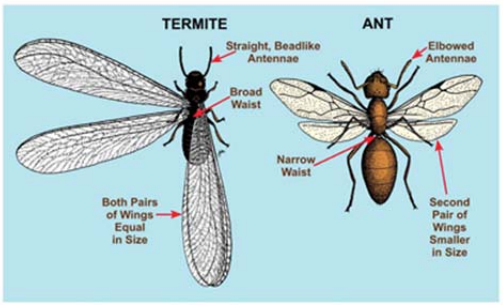
colony does not require moisture because the workers do not tend eggs. (The eggs would dry out without sufficient humidity.) For this reason, satellite nests can be found in relatively dry locations, such as insulation, hollow doors, and sound wood. The workers of satellite colonies move readily between their nest and the parent colony.

Winged Carpenter ant

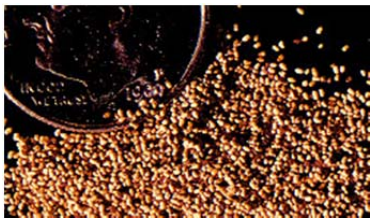
Carpenter ants are the largest black ants most people in North America ever see. The Workers and male Drones are ½ inch long, and the Queen is 1 inch long. Drones die quickly after mating with one or more Queens, and the Queens lose their wings.

Termites vs. Carpenter Ants

Flying ants and swarming termites are quite different, but you may need a magnifying glass to get a clear look at them. Don't be afraid to catch some and put them into a sealed plastic bag or container. When you look closely, you will see that termites have relatively straight, beadlike antennae, while ants have elbowed antennae. (See the Side by Side Comparison to the left.) The termite has two pairs of wings (front and back) that are almost equal length and size. The ant also has two pairs of wings but of unequal size; the front wings are much larger than the hind wings. The abdomen of the termite is broadly joined to the thorax (chest), while the abdomen and thorax of the ant are joined by a narrow waist called a petiole.



In addition to their physical differences, termites and carpenter ants cause different types of damage to homes. Termites actually eat wood, specifically the wood cellulose; so they can eat parts of your house. What they leave behind is their excrement or frass. It consists of very fine granules that look somewhat like sawdust. In contrast, Carpenter Ants eat protein and sugar; our homes are in their way, so they tunnel through them to get to their food. Carpenter Ants do not eat our homes, but they cause damage and leave sawdust in their wake.



Termite Frass

Termite Damage

Carpenter Ant Sawdust

Carpenter Ant Damage

Conclusion

Now you know that termites and carpenter ants look very different, but you'll need a magnifying glass to see the distinguishing details. Both termites and carpenter ants can cause severe structural damage to buildings. So if you see an insect that you think may be either a termite or carpenter ant, your home may be at risk.

Wendy Hiller, Master Gardener Intern

Deer Ticks and Lyme Disease

Understanding the tick that causes Lyme disease is an important first step in helping prevent Lyme disease. The tick responsible for Lyme disease is the blacklegged tick, or deer tick, *Ixodes scapularis*. It has a three-host lifecycle. Whew, three hosts. Think about that for a minute. Then think about where we humans are in that lifecycle.

In springtime the female tick lays somewhere around 2000 to 3000 eggs on suitable ground. Those eggs hatch into larvae. (Size of a period at the end of a sentence) Those bacteria-free larvae look for a host that is convenient to the ground, so they will attach to mice, birds, etc., have a blood meal, detach, and molt to the nymph stage (poppy seed size), then look for larger hosts to feed on such as rabbits, cats, squirrels, and us, detach and molt again to adult size (sesame seed size), then look for a third host to attach to (dogs, deer, us). The ticks are called deer ticks because deer or other large mammals (us) are needed to complete the lifecycle and enable the adult tick to feed, mate, lay eggs and start the cycle again. The lifecycle of the deer tick takes two years to complete. The larval tick does not carry the Lyme bacteria but acquires it by feeding on an infected animal. The larvae then molt into nymphs and lay dormant until the following spring when they can transmit the disease when they seek, find and feed on a new host. The disease carrying nymphs molt into disease carrying adults. If the nymphs or adults don't feed on an infected host they don't acquire or transmit the disease.

Comparative sizes of three stages of deer tick

How do we prevent tick-people interaction?

The most effective way to prevent Lyme disease is to teach yourself and your children to look for ticks after being in an area that might contain them. Know the areas that contain ticks and take special care in checking yourself and your children after being in those areas. Wooded areas and high grasses are more likely to contain ticks. If you have an area like that, it is suggested that you make a three-foot mulch barrier between your lawn and the rougher areas, as ticks don't generally like manicured areas. It is helpful to wear light colored clothing so you can see and remove ticks, and to tuck your pants in your socks so the ticks can't climb under your clothes. Taking clothes off and putting them in the dryer on high heat for an hour will kill ticks.

The pesticide bifenthrin, (trademark name Talstar), is effective in killing ticks in outdoor areas. Even though it is effective at killing ticks, that does not mean that using the pesticide will prevent Lyme disease. There are also many problems associated with the use of this pesticide. Product information about bifenthrin, states that it is highly toxic to honeybees and aquatic invertebrates. Skin contact may occasionally produce sensations such as rashes, numbing, burning or tingling. The sensations are reversible and usually subside within twelve hours. Skin contact may occasionally produce sensations such as rashes, numbing, burning or tingling but the sensations are reversible and usually subside within twelve hours (Material Data Safety Sheet).

It is effective if sprayed during peak nymph tick season (June, July) with lasting effects through the start of the following tick season in May. Bifenthrin can bioconcentrate in the soil. It is slightly toxic to waterfowl and upland game birds. It is highly toxic to all bees, caterpillars and a host of other invertebrates. It is a general pesticide so it kills many different insects, beneficial insects included. It is not systemic so plant roots will not take it up, which is a good thing. It does not readily evaporate so actively pollinating bees will not have a direct way of coming in contact with the spray unless the spray has been placed on blooming plants by an

applicator who failed to follow instructions.

Unfortunately, the pamphlet put out by the county and health department shows the applicator doing exactly what we are not supposed to be doing with the pesticide—spraying it on open blossoms.

Does spraying the pesticide prevent Lyme disease?

It has not yet been determined whether using the pesticide can prevent Lyme disease but it is known that many people are using the pesticide, including the Loudoun Board of Supervisors. A study is being done in certain areas of New York, Maryland and Connecticut to see whether a springtime application can prevent tick borne diseases.

Deer. They are enchanting. Think how often we see them. Does anyone see a correlation between the increased population of both people and deer and the high presence of deer ticks and Lyme disease? Notice the browse line in forests where the deer have eaten everything that they can reach. Look at the unfortunate consequences of deer-auto interactions that go on in our rural to metropolitan areas. We must consider the role of deer when thinking of ways to control tick borne disease. Studies have shown a correlation between reducing deer populations and a drop in Lyme disease (Mumford CT, Monhegan Island, Fairfield, CT). The studies have shown that reducing the population to 8-10 deer per square mile reduces the number of cases of Lyme disease.

The Center for Disease Control, American Lyme Disease Foundation, Inc, and Ticknet all have reliable, science based information on how to deal with ticks and disease as well as a host of other topics. Our local health department is a good source of information despite the incorrect booklet illustration. They do have a link to a tick management handbook with much helpful information, available online. The National Institute of Allergy and Infectious Diseases (NIAID) is a resource for research and is looking for volunteers for clinical studies.

Educate yourselves and your loved ones and leave room for the science that will come from research.

Sharon Kearns, Master Gardener

Beauty and the Bees

On the top of a hill in the Blue Ridge Mountains in Floyd, VA sits a sanctuary devoted to bringing and allowing bees to function and exist as their nature intended. Spikenard Farm and Honeybee Sanctuary's mission is to promote sustainable and biodynamic beekeeping through education, research and a honeybee sanctuary, where people can experience a beautiful landscape in which honeybees and other pollinators can live, heal and thrive. Gardens grace the land with seven types hives placed in a circle in the midst of plants that support their needs.

Biodynamic farming builds and enriches the soil. Biodynamic beekeeping cooperates with the natural order of the hive, maintaining the integrity and health of the bees.

Submitted by Judith Dreyer, MS, BSN, RN, Fauquier County Master Gardener

ABCs of Trees

Botanical Name: *Halesia Carolina*
Common Name: Carolina Silverbell

NATIVE

Zones: 4 – 8

Family: *Styracaceae*

Habit: medium-size tree**,** deciduous

Form: low-branched tree, rounded crown

Height: 30 to 40 feet

Spread: 20 to 35 feet

Growth rate: medium, 9 to 12 feet over 6 to 8 years

Texture: medium in all seasons

Leaf: alternate, simple, ovate or elliptic; 2 to 5" long, $^{1}/_{3}$ to ½" wide, dark yellow green

Flower: white, bell shaped, ½ to ¾" long, 4-lobed

Fruit: 1 to 1 ½" oblong, 4-lobed, green changing to light brown September to late fall

Bark: gray to brown to black combination, ridged and furrowed with flat somewhat lustrous ridges that develop scaly plates. Provides winter interest.

Site Requirements: sun to partial shade; prefers well drained, moist acidic soil

Diseases and Insects: few pests

Landscape Uses: a good understory tree, good for woodland borders. The white bell-shaped flowers and small size make it a desirable tree for landscaping. The seeds are eaten by squirrels and the flowers provide pollen for bees.

Related Species:

Halesia diptera **(Two-winged Silverbell)—**small rounded tree, multi-stemmed or low-branched.

Halesia monticola **(Mountain Silverbell)**—larger flowers and fruits, and a bigger tree at 60 to 80 feet. Zones 5 to 8. Native in Appalachia above 3,000 feet.

Recommended Cultivars:

Magniflora—large showy flower, difficult to find**.**

Rosey Ridge—pink flowers in clusters, 20 to 30 feet

Wedding Bell—small tree (20 feet), larger flowers

Alta Jones, Master Gardener, Tree Steward Intern

ABCs of Trees

Botanical Name: *Ilex opaca*
Common Name: American Holly

NATIVE

Zones: 5 - 9

Family: *Aquifoliaceae*

Habit: slow growing, medium-sized evergreen

Form: young trees are densely pyramidal, may become open, irregular and high branching in maturity

Height: 40 to 50 feet

Spread: 18 to 40 feet

Texture: medium in all seasons

Leaf: alternate, simple, elliptical, dull to dark olive green evergreen with spiny teeth, 1 ½ to 3 ½" long and about half as wide. Underside of leaf is yellow-green

Flower: dull green and white 4-lobed fragrant flowers in singles or clusters of three. Blooms in May/June.

Fruit: red, berry-like, ¼ to ½" diameter, maturing in October

Bark: brown, rough, thin and not showy

Site Requirements: grows well in full sun and partial shade. Can grow in very dry to occasionally wet soil. Not particular about soil type—acidic to slightly alkaline, but prefers fertile, moist acidic soils. Plant in the spring in a wind protected location. Requires male and female plants to set fruit.

Diseases and Insects: minimum problems

Landscape Uses: a natural in a woodland garden. It also does well as a specimen plant in full sun. This plant tolerates drought, occasional wetness and salt well. It is one of the few large native evergreen trees and can be planted in groupings to form a barrier. Birds love the berries. Air pollution tolerant, so can be a street tree in urban environment. The tree maintains a central leader and conical shape even in the shade. Little pruning is required. This tree resists deer browsing which can be a problem with some of the cultivars, such as Nellie R. Stevens. Does not tolerate wind well, as foliage can burn in the winter when exposed.

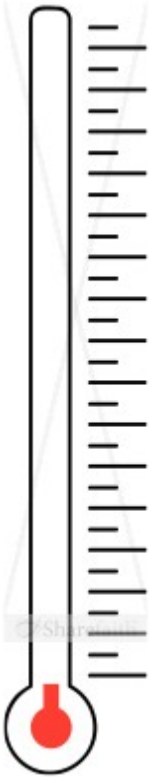
Notes: One of the national champions is in Buckingham County, VA. It is 55' by 51'. There are more than 1,000 cultivars of the specimen. Native habit is Massachusetts to Florida, west to Missouri and Texas.

Sharon Harris, Master Gardener, Tree Steward Intern

Trees Can Die of Heat Stroke Too

Humans suffer heat stroke when they have become overheated and cannot sufficiently cool down. The problem is often compounded by dehydration. Trees can also suffer hear stroke with the same disastrous results as humans.

The optimum growing conditions for trees include a temperature range from 70°F to 85°F. Trees dissipate heat mainly through transpiration—the evaporation of water from the stomata in the tree's leaves. This takes place when the stomata are open for the passage of CO_2 and O_2 during photosynthesis. When sufficient water is in the soil, a tree can pull over 300 gallons of water. There is a delay or time lag in water absorption by roots. Leaves can lose water much faster than roots can absorb water. When the temperatures are too high, the stomata close to prevent excessive loss of water. This stops the transpiration process and also stops photosynthesis which requires the exchange of oxygen for CO_2.



115° Enzymes and proteins become inactive. Cell death, tissue lesions and tissue death.

~100° Photosynthesis stops

95° - 105° Chlorophyll starts to break down: cell membrane components begin to "melt"

Above 94° Photosynthesis rates decline steeply.

70° to 85° Air temperature is optimum for tree growth.

60° to 80° Soil temperature is ideal for roots

Respiration is the process of breaking down and using the sugars stored through photosynthesis. As temperatures increase respiration doubles. Consequently the tree is burning through its food reserves but cannot make new food because photosynthesis has shut down. The tree is starving, toxins are generated and cell death begins to occur.

Street and parking lot trees are especially prone to heat stroke because of the heat this at reflected from roads, sidewalks and buildings.

Multiple days of extremely high temperatures can cause a number of system failures that the tree cannot recover from.

Treatment for tree heat stroke include:

- Watering, sprinkling and misting to increase water supply and reduce the temperature of the tree tissue.
- Partial shading when possible.
- A light layer of compost or mulch.

Avoid these actions during periods of extreme heat:

- application of fertilizers
- application of pesticides
- pruning green wood.

If a tree loses its leaves, continue to water it as it may recover and needs the water to form next year's leaves.

Carol Ivory, Master Gardener Tree Steward

The Garden Wonk: Mycorrhiza

About 15 years ago an arborist suggested that I have the soil around a failing 75 year old red oak injected with mycorrhizal fungi. Without much explanation he said that this procedure might help the tree survive – it didn't, the tree is long dead, but I remembered the term "mycorrhiza" and wondered about it. So I finally did some research and this is what I found.

"Mycorrhiza" refers to an association between fungus, *myco*, and the roots of a plant, *rhiza*. This relationship is almost always mutually beneficial. The plant receives water and nutrients such as nitrogen and phosphorus from the fungus. The fungus receives carbon needed for its physiological functions, growth and development from the plant. Both partners receive net benefit from the association. About 95% of all plants, woody and herbaceous, will form an association with fungi. The roots of plants excrete carbohydrates and proteins and slough off cells into the rhizosphere, the area of interaction between the surface of plant roots and the area surrounding it. These exudates attract fungi and microbes which in turn, help the plant.

Fungi usually grow from spores into thread-like structures called hyphae. A single hyphae is so thin that it takes thousands of strands to form a bundle that is visible to the eye. A teaspoon of good garden soil may contain several yards of fungal hyphae. Fungal hyphae can grow 40 micrometers a minute, and can penetrate hard surfaces. Thus fungal hyphae can locate new food sources and transport them relatively long distances.

When plant roots, which are huge in comparison to hyphae, absorb all the nutrients around them, they can rely on fungal hyphae for a source of water and nutrients. Mycorrhiza can increase the effective surface area of a tree's roots an amazing 700 to 1000 times. Thus mycorrhiza increases drought resistance, increases nutrient uptake, increases disease and pest resistance by reducing stress and produces an overall healthier plant.

Root surface extended by hyphae

There are two main types of mycorrhizal fungi. Ectomycorrhizal fungi (EM fungi), which associate mainly with hardwoods and conifers, grow close to the roots and form webs around them. The second type is endomycorrhizal fungi (AM fungi) which actually penetrate and grow inside the roots of herbaceous plants, shrubs and softwood trees. Common mycorrhizal networks can interconnect the roots of multiple plants and play a role in plant communication and allelopathy.

Healthy mycorrhiza depends on healthy, organic soils. Many horticultural practices can damage them. Tilling and even simple hoeing can rip apart the delicate net, which can then take months or even years to reestablish. When tilling is a yearly event, the fungus will never get a foothold. Too much synthetic fertilizer can also damage the fungus, as can pesticides and, of course, fungicides. Sterilizing and solarizing your soil will also destroy mycorrhiza. Compacted soil and flooding can also harm mycorrhizal networks.

Mycorrhizas flourish in soils with high organic matter, so adding compost is one of the best ways to encourage the establishment and growth of the fungi. Rather than digging in organic matter, which will destroy the fungal net, lay the compost on top of the soil and let it naturally decay into the soil.

Mycorrhizal inoculants are available from several companies, but adding these to your soil is usually not necessary unless the soil has been damaged. In addition, many strains of fungi are plant specific, and what you buy may not be the right one. Often, mycorrhizal inoculants will contain a mix of many different fungi in the hope that one will match your plant.

To circle back to my tree experience, out of four trees that I know were treated with EM fungi, three are dead and one is thriving. The three that died were already in serious decline and treatment was likely a bad recommendation. Is the fourth tree thriving now due to the fungal injection? There's no way of knowing.

Carol Ivory, Master Gardener, Tree Steward

Notes from the Help Desk:

Q: My mums grow quickly early in the season, the buds set, they get too tall and fall over, is there anything I can do about that?

A: Many of our perennials that are fall bloomers want to show us their stuff in June! It is just fine to pinch back perennials like mums, sedum, asters, goldenrod, joe pye weed and herbs. For mums and sedum, you can pinch them back by about 2 inches, taking the bud with it, several times before the middle of July to help make the plant more bushy and delay the bloom until early fall. For taller perennials like asters, goldenrod and joe pye weed, cut them back once when they are about 2-3 feet tall to keep them from getting too leggy and falling over. This way you won't have to stake them either. Many herbs get tall and leggy so if you are not harvesting them regularly, pinch them back so they won't bolt (flower and turn sour).

Q: I have this white residue that looks like ash on my bee balm leaves, what is it and what can I do about it?

A: Powdery Mildew is a common ailment on some of our most cherished plants. It is a fungal disease that can lead to yellowing leaves, leaf drop, stunted plant growth and distortion of buds, blooms and fruit. Asters, phlox, bee balm, hydrangea, crape myrtle, apple trees and more suffer from this disease that overwinters and emerges when the weather heats up to 60 degrees. Typically it thrives in shady locations where there is minimal air flow but will show up on leaves where the plants are in full sun where the plants are crowded together and there is poor air circulation. Best thing to do is buy disease resistant cultivars and keep the plants thinned out for air flow. If you already see the problem here is what you can do: inspect carefully and treat weekly as soon as you see it. Use neem oil. Remove badly infected plants and throw them away, do not compost them.

Powdery mildew on a leaf

Q: I found aphids on several of my plants, can you tell me about them?

A: Aphids, or plant lice, are small, soft-bodied insects. There are hundreds of different species of aphids, some of which attack only one host plant while others attack numerous hosts. Most aphids are about 1/10 inch long, and though green and black are the most common colors, they may be gray, brown, pink, red, yellow, or lavender. The best way to combat these insects is with a strong stream of water to knock them off the plant or let Mother Nature take care of them. Natural predators of aphids include lady beetles, lacewings, damsel bugs, flower fly maggots, certain parasitic wasps, birds, and fungal diseases all attack aphids. If you still feel the urge to combat with a pesticide, then try insecticidal soap or horticultural oil. Always read the label before using.

Lady beetle feeding on aphids

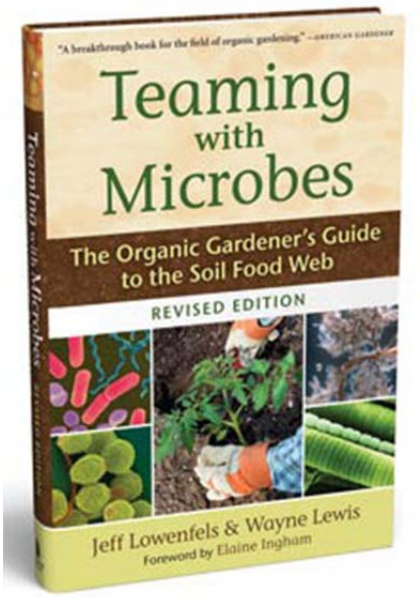
Q: How often should I water my lawn and how much water should I use?

A: Lawns require 1 inch of water every week. This includes water from rain as well as watering. Use a good rain gauge to measure the **total** amount of water that reaches your lawn. Good, deep, strong roots are developed through infrequent and deep watering.

Barb Bailey, Master Gardener

Teaming with Microbes — A Book Review

This revised edition book won the 2011 Garden Writers of America Gold Award for Best Writing—Jeff Lowenfels and Wayne Lewis turn very difficult science into understandable concepts for the organic gardener. As the title suggests, in order to have our soil teeming with microbes, we must "team" with them to provide a nurturing environment for a healthy garden.



The book is based on the soil food web, a complex world of soil-dwelling organisms whose interactions create a healthy environment for plants. In addition to the worms and insects that we can see, healthy soil contains a staggering number of bacteria, fungi and other microorganisms. A cup of native soil can contain 100,000 miles of fungi among lots of other living things, visible and invisible.

The soil food web below ground is even more complex than the food chain above ground. Plant roots excrete carbon and other nutrients, think of it as root perspiration. This attracts a host of fungi and bacteria that benefits the plants and often, one another. A succession of larger critters eats the smaller ones and they all eat dead plant matter, dead organisms and other "garbage." All of that eating, pooping and churning around — undisturbed by mechanical intervention and without synthetic chemicals — produces incredibly healthy and productive soil, naturally.

Teaming with microbes involves doing less not more. No tilling which destroys the fungi and disrupts the soil food web. No use of chemicals, that is, fertilizer, or any pesticides. You don't have to turn your compose, nor should you work it in to the soil, just spread it on the top. Don't think of "feeding" your plants, think of feeding the microorganisms. If you think your soil needs a boost try compost tea, fish emulsion, soybean, corn gluten, alfalfa, blood or cottonseed meal.

This book is divided into two sections. The first section explains the soil food web, basic soil science and 10 brief chapters on the life in the soil: bacteria, archaea, fungi, algae and slime molds, protozoa, nematodes, arthropods, earthworms, gastropods, and reptiles mammals and birds. Each chapter in understandable, with color photos of things beautiful (mushrooms), and things hideous (mites and nematodes), not to mention ideas for a horror film (slime molds engulf food and digest it internally).

The second section applies the science of Part I to yard and garden care. There are chapters on restoration and maintenance, compost, mulch, compost teas, maintaining trees and shrubs, lawns and growing vegetables. There's a very helpful chapter on what to do in each season.

Remember, no one ever fertilized an old growth forest.

Carol Ivory, Master Gardener, Tree Steward

The *Trumpet Vine* is produced quarterly by the Loudoun County Master Gardeners. It is available via email and can also be downloaded along with archive copies from the Loudoun County Master Gardener website. If you would like to be added to the email distribution list, please send a message to TV@loudouncountymastergardeners.org with "Subscribe" in the subject line and your name in the body of the message.