Keep your eyes peeled, my father used to say, and you’ll see something interesting. This is nowhere more true than the world of horticulture. During bike trail excursions last week in local woodlands I spotted a handful of white flowering dogwoods (*Cornus florida*). Many plant people call flowering dogwood the loveliest of our native small trees. While indigenous locally, nowhere do they seem abundant, so I’m counting my discoveries as serendipitous events.

Flowering dogwood was once a popular landscape tree and big business for the nursery industry. Then, in the 1970’s, plant pathologists discovered that a new disease, dogwood anthracnose, was *C. florida* in many parts of the country. This fungal scoundrel, scientifically known as *Discula destructiva*, enters the tree through the foliage, then travels into twigs and branches. Once it reaches the trunk, it has effectively destroyed most of the tree. Government agency studies have shown that flowering dogwood populations in natural areas declined by 49% in the eastern U.S from the mid 1980’s to the mid 2000’s. New York was even harder hit, losing 63% of its dogwoods. So finding some thriving in our local woods was indeed a treat.

The story goes that even the Commander in Chief noticed the decline of the dogwoods. President Reagan, visiting The Camp David Retreat in Maryland, witnessed the problem and expressed concern. Researchers from the University of Tennessee then became involved in studying the dogwoods in Catoctin Mountain Park, an area especially hard hit by *D. destructiva*. Ten years after the disease swept through, seemingly killing all the
dogwoods, they found four survivors. The most vigorous of the bunch was surrounded by hundreds of fellow dogwoods, all dead. Judging this tree as possibly anthracnose resistant, they propagated cuttings from it and performed further studies. With continued positive results, by the late 1990’s this tree began to make its way into the nursery trade under the name ‘Appalachian Spring.’

A vigorous grower, ‘Appalachian Spring’ has an upright habit, produces a profusion of tiny yellow flowers surrounded by showy white bracts, and bears attractive red fruits in the fall. The autumn color ranges from red to purple. The tree will grow to an estimated 15 to 20 feet tall with a similar spread. Like other flowering dogwoods, it prefers an edge of the woods setting with rich soil. While resistance to dogwood anthracnose is a tremendous advantage, ‘Appalachian Spring’ still may get powdery mildew disease. Just a brief search showed that while some mail-order nurseries list ‘Appalachian Spring,’ actually finding it in stock and procuring one might be dreamed of than done.

Learning of this success story got my mental wheels turning. Are the few local dogwoods I’ve seen also resistant, or were they never exposed to tremendous amounts of the pathogen, and therefore untested? It seems a worthy project might be to make observations on local trees, and perhaps grow some cuttings into trees under garden conditions. Much might be gained, plus it sure beats television.

Text by David Chinery

Answers to the Green Shots quiz on page 100
Feed The Buzz

It seems that every good cause has its own week-long celebration. While National Nurses Week seems especially worthy and we certainly should consider reviving National Brotherhood Week in updated form, the Master Gardeners and I are inviting you to celebrate National Pollinator Week with us. On the evening of June 21, we’ll be answering the question “What’s Happening In The Pollinator Garden?” at our Demonstration Garden at the Robert C. Parker school in North Greenbush. We’ve joined with the Pollinator Partnership and many others to raise awareness and help the cause.

Why should we care about the mysterious workings of plant pollination? One selfish answer is that human survival depends on pollinators. Worldwide, approximately 1,000 plants grown for food, beverages, fibers, spices, and medicines need to be pollinated by animals in order to produce the goods on which we depend. These include such treats as apples, coffee, melons, peaches, and pumpkins. Also on this list are chocolate, vanilla, almonds and blueberries, without which life wouldn’t be worth living. Pollination occurs when pollen grains are moved between two flowers of the same species, or within a single flower, by wind or animals that are pollinators. Successful pollination, which may require visits by multiple pollinators to a single flower, results in healthy fruit and fertile seeds, allowing plants to reproduce.

Many different creatures pollinate plants. Even the youngest among us know something about the important pollination services provided by western honeybees (*Apis mellifera*), but consider that a wide variety of beetles, flies, butterflies, moths, birds and even bats spread pollen from plant to plant. Often, it is the lure of sweet nectar and the highly nutritious pollen itself which draws a mobile animal in to help propagate an earthbound plant. Some pollinators are generalists, visiting many different species of plants, while others specialize in just one type. If Ronald Reagan was The Great Communicator, I’ll call the western honeybee The Great Pollinator, since they will make use of a tremendous range of flowers, from the earliest pussy willow in spring to the latest asters in fall. So common was the western honeybee at one time in the United States that it could easily be found in woodlands, unmaintained houses and other niches as well as beekeeper’s hives, but today this species is much diminished by the same factors plaguing other pollinators. They were brought to our shores by the earliest European settlers, although their former abundance made them seem like natives.

Mowing lawns less frequently is one way we can help. Researchers working in Springfield, MA, recently found that when clover, dandelions and other lawn weeds were allowed to bloom, they fed honeybees and other pollinators. Lawns mowed every three weeks had more than double the number of lawn flowers than lawns mowed every week or every two weeks. The lawns mowed every two weeks had the greatest number of bees but the lowest diversity of bee species compared to the other mowing intervals. Let’s consider doing less for more buzz.
“What is it?” is a common refrain in my office these days, with photos of plants or insects usually attached. Some present a challenge, as there is always something new to learn in gardening, while others are as familiar as the furniture. When two different people sent in photos of mugwort (*Artemisia vulgaris*) last week, I gave them each the same advice: don’t turn your back on this plant. Left unchecked, its rhizomes will spread throughout your garden and perhaps follow you into the house.

Mugwort (photo at left) may arrive in your yard in various ways. Its roots might be transported in soil or compost. It spreads in field nurseries, so if you buy a balled-and-burlapped tree, you might get a mugwort bonus. It might slide under a fence from your lazy neighbor’s place, and I’ve even seen it sold at plant sales. In many ways it appears rather innocuous. It has medium green, deeply cut leaves and usually grows three to four feet tall. Mugwort foliage looks a bit like a chrysanthemum, and something like common ragweed. Its flowers are many, but small and nondescript. This is a plant which could hide in the middle of the room, until it starts to spread. I’ve seen patches of mugwort expand to many hundreds of square feet. It may also aggressively shoot skyward, too. Books say six feet, but there is one public park in the Hudson Valley where I swear the ugly mug is over seven feet high and running across at least a half an acre.

Not surprisingly, mugwort is nowadays regarded primarily as a weed. But not so long ago, the earliest European settlers traveling to North America had good reason to carry mugwort along. Lacking a local chain pharmacy, these brave folks depended on herbs for both their mental and physical survival. When used to treat felons, painful-pus producing boils on digits, this *Artemisia* was called felon herb. If intestinal worms came a-knocking, they called it wormwood and give some a chew. A wide variety of other ailments, which we would call *colds*, *epilepsy*, *colic*, *fevers*, *asthma*, *bronchitis*, *sciatica* and *kidney problems*, were all treated in some way with mugwort. Fresh or dried mugwort leaves not only repelled insects, but relieved insomnia and promoted good dreams when placed beneath a pillow. And perhaps most importantly to a thirsty Colonist, the beer in their mugs, before the use of hops, may have been flavored with mugwort, which translates to “vessel plant.”

Next consider mugwort’s close cousin, *Artemisia lactiflora*, white mugwort (photo at right). It has bolder flowers of a stronger white, and is sometimes compared favorably to astilbe. It stays in the three to four foot tall range, and best of all, it makes a polite clump and doesn’t spread. I’ve had a plant of white mugwort in my garden for years with no complaint. In fact, when it flowers in high summer, I often muse on how attractive, low-maintenance, and pest-free it is. So grow *A. lactiflora* and avoid *A. vulgaris*, even if you have boils on your digits.

Text by David Chinery
What to do in June

June is a delightful month. The days are the longest of the year, the air is warm, and much is happening in the garden. What a wonderful time to be outdoors!

Divide the spring flowering perennials that have finished blooming.

Train your grass to grow deep roots. Mow high. Let your grass grow to 3.5-4 inches, and then mow it down to 3 inches.

Mulch gardens to save water and defeat weeds.

Make friends with your compost pile, adding both greens and browns, turning often, and keeping moist. Use the resulting compost to give a boost to your garden soil.

Thin small fruits on the branches of apple, peach or plum trees. One fruit per six inches.

Enjoy your strawberry harvest or visit a strawberry festival.

Welcome beautiful peonies (and deadhead them once they are done).

Pinch geraniums to encourage fuller growth.

Prune spring flowering shrubs after they finish blooming, and shear others such as privet, to keep one step ahead of their vigorous growth.

Keep an eye out for pests by watching for yellowing leaves, wilted new growth, or twisted foliage. A close look (especially at the undersides of leaves) might reveal mites, aphids, or something else.

Give your summer-blooming roses some fertilizer in June and again in July for a continuous show.

Remove the flowers from rhubarb (see photo at right).

Celebrate mid-summer’s night – maybe under the stars!

Text by Rensselaer County Master Gardener Becky Raymond
Everyone knows that plants need water, but over-watering is potentially as bad for plants as under-watering. House plants probably are at greater risk from this than veggies in the garden because soil drainage and atmospheric evaporation ameliorates many beginning gardener mistakes. But let's review some basics for everyone anyway.

**How much moisture:** The gardener's old rule of thumb is that vegetables typically need the equivalent of 1" of rain per week in order to thrive. That level of watering goes a long way to give veggies a steady moisture level, assuming your garden's soil type is loamy and includes a sufficient amount of humus (the organic components in soil that significantly abet water retention).

For gardeners following Mel Bartholomew's *Square Foot Gardening (SFG)* regimens of measuring water in cups per square foot but who compromise and secretly use a hose, a standard garden hose with an adjustable wand attachment set to the "gentle shower" level or its equivalent delivers a cup of water about every 3-4 seconds. For those who may not be familiar with SFG, many veggie gardeners I know, including myself, consider this book to be probably the best guide to growing in backyard venues for both new and experienced hands. Although 2013 volume is the latest edition, any second hand copy fills the bill...

**Soil type or texture:** The basic composition of garden soil plays a major role in how water is retained. There are three basic soil types: clayey with the finest particle size, loams with mid size particles, and sandy with the largest size particles. Water tends not to permeate readily into clay soils; you will probably see it quickly pooling and/or running away on the surface from your veggies. In sandy type soils, water drains through quickly, and so these soils tend to dry out quickly. For loamy soils, the goldilocks of soils, water will permeate into the soil at a moderate pace giving plants more time to absorb it. But, in all three cases, it is the organic residues from bio decomposition that hold soil and humus particles together into various sized clumps promoting both the soil's aeration and water retention qualities.

*fwiw: Humus only accounts for 2 - 5% of the solid weight of garden soil.*

If your garden's soil is either clayey or sandy, you will need to adjust your watering frequency and amount to approximate that ideal state of 1" of rain per week. Probably, the best approach is to invest in a moisture meter (about $10) that will let you check the moisture of your soil at different depths. (These meters indirectly measure the soil's water content as reflected by conductivity. Low readings indicate low water content; high scores indicate more water.)

But, you might just want to get some idea about how fast water drains through your soil by doing your own simple percolation test. Dig a small hole about 8 - 12" in diameter and 8 - 12" deep. Fill the hole with water and let it drain out over night to moisturize the surrounding soil. The next morning, refill the hole with water, then measure the water's depth and every two hours thereafter. Ideally, the water level should recede about 2" every hour, but a rate between 1" and 3" per hour is okay.

https://greywateraction.org/how-do-percolation-test/
Although germinating seeds will be just looking for moisture in the top 2" for a short time, your tomatoes, for example, at mid-season have roots that penetrate at least 8 - 10" into the soil. When their fruit is ripening, their roots will be 18 - 24" into the soil, and you need to apply water frequently enough for it to soak down to that level. Watering until it runs off surface areas or pools are not necessarily reliable indicators of sufficient watering.

**Mulch, Compost and other tactics:** Soil texture and humus content are only a couple of factors affecting soil moisture level. Other important components of the "hydrologic (i.e. water) cycle" impacting soil moisture include transpiration, evaporation, runoff, condensation and, of course, precipitation. Some gardening techniques can be used to improve and/or stabilize moisture levels to lessen the impact of water loss from these processes.

We've already mentioned how adding biomass (via compost) into soil helps to retain water. Mulching is another obvious technique, and your compost can also be used as a mulch. Straw, grass clippings, shredded newspaper (albeit, messy) or leaves, or peat moss added to the top of the soil both insulates against the extremes of heat or cold and also helps soil to hold moisture by reducing the rate for evaporation.

Reminder: *Sawdust and tree bark are not ideal mulch choices because the bacteria that will be decomposing these very woody ingredients will compete with your vegetables for the soil's nitrogen. Pine needles are not a good choice either because they can slowly increase acidity; it's better to save them for your blueberries or, better yet, your rhododendrons.*

In clayey or compacted soils, as mentioned above, water tends to runoff instead of soaking into the soil. You can counter this to some degree by creating raised beds or raised rows and amending this soil by adding sand along with humus. [The larger sand particles, when they clump with bio residues from decomposition, allow for aeration and hydration of the soil.] Another tactic to counter runoff loss is by creating small, shallow furrows for your seeds or seedlings so that some water will collect and gain extra time to permeate into the soil.

**How much mulch is enough?** 3 - 4" will reduce evaporation and insulate as well as suppress some weeds, but 6" would be even better. Actually, even lesser amounts of mulch help -- just 2" of mulch will lower soil temperatures by a few degrees. Recently, my appreciation for mulch's insulating power was reinforced. On May 26 the thermometer read 90°F in my backyard. I measured the soil temperature at a depth of 5" under a 3 - 4" layer of straw. The soil's temperature was 72°F. I also had a 4' x 4' bed without mulch (I had run out of straw) and its temperature at 5" was 78°F! I also have a bed with just 1 - 2" of mulch (I was running out of straw), and its temperature registered 76°F - a little better than the bare soil's. - - I need to add mulch to these beds, obviously.

Text by Master Gardener Irv Stephens. Find out more about local vegetable gardening at Irv’s new blog:

https://rensselaercountyvegetable.blogspot.com/
How & when to water? There are many ways to give plants a drink -- by hand held hoses, watering cans, soaker or drip hoses and sprinklers as well as elaborate timed and moisture metered systems. Your choice is probably determined by the size of your garden, your personal calendar and, of course, your budget. I have nine raised beds, and just run a hose through a PVC pipe under a short section of lawn to the garden. Then I water each bed as needed using a long necked wand set on "gentle shower" and water at the base of plants. I don't mind the time I spend watering because so far:

1. I like being in the garden, and
2. I like being in the garden, especially in the morning.

Soaker hoses do appeal to me. The prospect of setting up all those separate connectors between beds, getting a timer ($30) and installing hoses (200+ ft) has so far successfully detoured me from seriously investigating soakers. Also, as long as I can induce friends to garden sit for me when I'm traveling, I probably will continue to avoid the issue...

I try to water in the morning, like the good gardener who I am pretending to be, so that any water that gets on the leaves has a chance to evaporate during the day. Watering in the evening is generally not recommended because cooler evening temperatures combined with wetted leaves can promote the growth of molds and other plant diseases. However, I admit that it does sometimes rain at night, and plants usually seem to come through okay while lacking umbrellas or slickers - except at the start or end of growing seasons when temperatures can be a lot cooler.

Watering at high noon also is not recommended. Soil evaporation and plant transpiration rates are higher, and plants are stressed by trying to cope with water loss. They are losing water through their leaves faster than their roots can absorb it from the soil. Watering your garden at 12 Noon with the temperature at a sizzling 93°F doesn't necessarily help the plants much because the water spraying from the hose is probably around 55°F. This may cool the soil a bit, but the roots' absorption rate actually slows down with the lower temperatures. If you have stored water, e.g. rain barrels, you can use it because that water's temperature will be close to ambient temperature.

Using lawn sprinklers for watering is less desirable than even just aiming your hose at the garden from a distance because of increased losses from evaporation during the water's short flight in the air and from droplets that collect on plant leaves. Plus, lawn sprinkler patterns always mis-direct some water outside of where it's needed. I know, if you're in a hurry and/or tired, setting up a sprinkler in the middle of the garden is hard to resist. The sprinkler does deliver needed water; just realize that it's not efficient and that only a brutish sort of fellow gardener will criticize you for it.

Ollas - a traditional clay pot watering system: For those who might be on a well water system and worried about pumping your supply dry, ollas might be an option. Ollas are porous clay pots (unglazed) without a seep hole in the bottom that are buried in the ground near your plants. Water gradually passes through the walls of the pot keeping the soil moist at the root level. This is an ancient technique used in very dry areas. I haven't tried it yet, but I might experiment with it this year for my pole beans. Last year I tried burying plastic soda bottles with tiny holes punched in the sides to let water gradually out, but my top seals were not intact and no vacuum was created. Result: the water leaked out too fast... Using clay pots, you don't need to worry about vacuums... If I remember to try ollas, I'll report back later in the year. [Additional information about making your own ollas is available from the *Global Buckets* website.]
It seems to me that nothing tastes as good as a bacon, lettuce and tomato sandwich if the tomato is homegrown. Let’s learn a little botany as we anticipate the ripening of lettuce and tomatoes. The plants that gardeners grow tend to be flowering plants or angiosperms (angio = vessel; sperm = seed), so angiosperms are plants that produce seeds in a container. The other seed plants are the gymnosperms (gymno = naked) such as pines, whose seeds are not enclosed in a container.

The tomato develops from the flower. Perfect flowers have four parts: the sepals, the petals, the anthers and the carpel or pistil. If they are imperfect, one or more of the parts is missing. Heading from the outside to the center of a perfect flower, we first encounter the sepals. Sepals are green leaf-like structures that protect and enclose the flower bud (think of a rose bud). The petals may delight our sense of beauty or they may attract insects or possibly do both. The stamens constitute the androecium (andros = male). Each stamen consists of a filament and an anther at the tip. The anther is the structure in which microspores are produced by meiosis (the special division that halves the genetic material). The microspore nucleus then divides to produce two nuclei. At this stage it is released from the flower as pollen. One of the two nuclei (the generative nucleus) in pollen divides to form two sperm. The other nucleus (the tube nucleus) directs the formation of a long tube down to the egg. The carpel is normally in the center of a flower. The carpel or carpels is/are the gynoecium (gyne = woman). At the top of the carpel is the stigma (usually it is sticky to catch pollen), then, heading down the carpel is a thin neck or style which leads to the swollen ovary. Inside the ovary one finds one (peach) or many (tomato) ovules. The ovary matures into the fruit, the ovules mature into seeds. In the ovule a megaspore mother cell goes through meiosis to produce one functional megaspore and three cells that are destined to die; their only function is to be the trash barrel for the excess DNA.

The megaspore is a single cell which has half as much DNA as the cells of the parent plant. The megaspore will divide three times, producing eight cells, one of which is the egg. The structure in which the egg is found is called the embryo sack. Once the two sperm reach the embryo sack, one sperm fuses with the egg and the other sperm fuses with two of the other cells formed from the megaspore. The sperm that fuses with the egg forms a zygote, the first cell of the next generation. The zygote grows into an embryo. You can easily see an embryo if you open a large seed such as a bean.

What about the other sperm and the two cells? The cell that’s formed by that fusion has three sets of DNA and it is called endosperm. Endosperm will divide and serve, at least initially, to nourish the zygote. In most plants endosperm does not persist; it is replaced by carbohydrate containing cells. Again, take a bean seed. On its concave surface, you will see a scar (the hilum). This is where the bean (former ovule) was attached to the bean (ovary). If you stick a needle into the hilum, the seed will break into two halves. The embryo is easily seen and most of the two halves are the carbohydrate-containing cotyledons.

Count the number of seeds in your tomato and that is the number of fertilizations that had to occur in order for the ovary wall to grow into that delicious tomato.
Our photos this month come from Rensselaer County Master Gardener Donna Millet, who has created a quiz. Donna writes, “When an item is found out of its normal context, it may be difficult to determine what it is. Often, that is the case early in the growing season when plants are just beginning to emerge, or if parts of them are left over from the previous year. Take a look at these and see how many you can correctly identify.” The answers are on Page 2.
“There’s nothing like listening to a shower and thinking how it is soaking in around your green beans.”

Marcelene Cox, American writer

Gardening Questions?
Call The Master Gardeners!

In Albany County: Call 765-3514 weekdays from 9:00 AM to 3:00 PM and ask to speak to a Master Gardener. You can also email your questions by visiting their website at www.ccealbany.com

In Schenectady County: Call 372-1622 weekdays from 9:00 AM to Noon, follow the prompt to speak to a Master Gardener and press #1. You can also email your questions by visiting their website at http://counties.cce.cornell.edu/schenectady/

In Rensselaer County: Call 272-4210 weekdays from 9:00 AM to Noon and ask to speak to a Master Gardener. You can also email your questions to Dhc3@cornell.edu

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Cornell Cooperative Extension of Rensselaer County’s

Summer Gardening Programs

Held at:
The Demonstration Garden
at The Robert C. Parker School
4254 Route 43, Wynantskill (North Greenbush) 12198

“What’s Happening In The Pollinator Garden?” Thursday, June 21 from 7 to 8 PM. Join us to learn how you can influence the populations of pollinators through plant choices. Master Gardeners will lead you through our Pollinator Garden explaining the specific plants for specific pollinators such as: bees, hummingbirds, butterflies, bats and even people. This program is in conjunction with National Pollinator Week. Be prepared to walk and stand, or bring an easily portable chair.

“Making Fermented Veggies” Thursday, July 19 from 7 to 8 PM. Fermentation is an ancient form of preserving food. In the process of fermentation, beneficial microbes act on food, adding nutritional value, and are themselves a wonderful source of probiotics. We’ll discuss how to make fermented vegetables. It’s simple to do, and a great way to make a delicious addition to your diet. Presented by Master Gardeners Janet Poole and Linda Ford.

“What’s Happening In The Vegetable Variety Trial Garden?” Tuesday, July 24 from 7 to 8 PM. Master Gardeners are growing a variety of crops in the raised bed trial garden, including garlic, arugula, tomatoes and herbs. We’ll discuss what’s thriving, what’s not, and why, as well as do a little harvesting. Bring your own vegetable questions for discussion, too! Be prepared to walk and stand, or bring an easily portable chair.

“Managing Your Wild Weeds” Thursday, August 2 from 7 to 8 PM. Weeds are one of the gardener’s biggest challenges and there are several strategies to keep them at bay. We’ll look at various options, including both organic and non-organic herbicides, for weeds in garden beds as well as in lawns. Presented by David Chinney, CCE of Rensselaer County Educator.

“Cooking In The Garden” Tuesday, August 14 from 7 to 8 PM. Back by popular demand! What can you do with summer’s gorgeous produce? Using vegetables grown on-site Master Gardeners will prepare a variety of fresh and healthy dishes to share with the audience. Join us to learn new recipes and enjoy sampling some delicious summer foods! Master Gardener leaders will be Nancy Scott and Barbara Nuffer.

For more information, call Cornell Cooperative Extension’s Horticulture Program at (518) 272-4210 or e-mail dhc3@cornell.edu. Directions: From Interstate(1-90) Exit 8; east onto Rte 43; pass through Rte 4 intersection toward West Sand Lake; (approximately 2.1 miles); Left at Robert C. Parker School.

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