July 2021-Vol.7, No.7

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The Ornamental Garden in July

By Susan Martin | July 2021-Vol.7, No.7

July 1 is the average midpoint for our frost-free growing season of 182 days in Virginia. I lay rather low as the temperatures climb during this hottest month of the year. According to US Climate Data, July is also the wettest month in Virginia. Rainfall in Charlottesville averages 5.3”, a little higher than the state average of 4.7”. This combination of heat and moisture causes a burst of vegetative growth. The perennial garden is abloom with color: Rudbeckia, coneflower (*Echinacea)*, butterfly weed (*Asclepias tuberosa*), Agastache, bee balm (*Monarda didyma* and *Monarda fistulosa*), tickseed (*Coreposis*), catmint (*Nepeta*), Culver’s root (*Veronicastrum virginicum*) and so much more. The weeds like heat and moisture too! What tasks are required to keep our July gardens looking fresh and happy?

Culver's Root (Veronicastrum virginicum) Photo: Susan Martin, Ivy Creek Natural Area, Charlottesville, VA

JULY TASKS

- The **"wettest" month of the year** is based on average rainfall, but reality may differ from statistics. One inch of rain or water per week is a good guideline for established plants. Keep an eye on the rain gauge and prepare to **provide supplemental water** as the temperatures climb.
- July is a month when gardeners are especially rewarded for having successfully **grouped plants with similar moisture needs.** My full-sun garden includes ornamental grasses and bee balm (both *Monarda didyma* and *Mondarda fistulosa*). Grasses like it hot and dry. *Monarda didyma* likes it sunny but moist. This means I need to supplement this species with additional watering. Fortunately, this garden is close to the house and to a hose. *Monarda fistulosa*, also called bee balm or wild bergamot, can take somewhat drier conditions as compared to *Monarda didyma*. Butterfly weed (*Asclepias turberosa*), also planted in the full-sun garden, doesn't require supplemental watering, and is a good companion for ornamental grasses. When assessing your garden's strengths and weaknesses, keep moisture compatibility at the top of the list. At the least, consider whether you are willing to put in some extra effort when plants have different moisture needs.
- **Use soaker hoses rather than overhead sprayers.** Make sure to water at the base of the

plant rather than wetting the foliage. This approach will help reduce problems such as powdery mildew.

- **Check container plantings for moisture needs** on a daily basis, depending on the types of plants and plant groupings.
- Continue to **weed** garden beds; weeds compete with plants for moisture and nutrients.
- **Edge** garden beds for a neat appearance.
- **Mulch** depth should be about 2-3" deep; refresh when necessary to maintain moisture, help condition the soil, and suppress weed growth. Avoid overly heavy mulching which could cause root rot. Keep mulch away from the crown of perennials.
- **Deadhead** to encourage repeat blooming. See the June "Tasks and Tips" article for guidelines on how to deadhead and how to cut back summer bloomers.
- Mid-July is the cut-off point for **pinching back** plants such as asters and chrysanthemums to promote bushier habits. Cutting back later in the summer might sacrifice blooms this fall.
- Perennials that can be divided in July/August include: bearded iris, oriental poppy (*Papaver orientale*), and daylily (*Hemerocallis*).

IDENTIFY PLANTS THAT ARE RESISTANT TO POWDERY MILDEW

At midsummer, powdery mildew often appears on the foliage of many plants. Both *Monarda didyma* and *Monarda fistulosa*, for example, are subject to fungal problems. The June "Tasks and Tips" article provides a good **description with photos of both powdery mildew and downy mildew.** One way to deal with fungal diseases is to select plants that are more resistant to these diseases.

Monarda fistulosa Photo: Susan Martin

Monarda didyma Photo: Susan Martin

The Mt. Cuba Center has conducted experimental trials on *Monarda didyma* and *Monarda fistulosa* to determine which cultivars are more resistant to fungal diseases. See this article for a list of the most successful cultivars. Additional work is being conducted at the Mt. Cuba Center on the attractiveness of these monarda cultivars to pollinators. I haven't yet seen the published results of these studies; interested readers can periodically check the Mt. Cuba research trials for results, and to see the results of other plant trials as well.

The Mt. Cuba Center also conducted trials on species and cultivars of phlox, another plant that is very susceptible to powdery mildew. *Phlox paniculata* (garden phlox) is the most popular of the phlox and represents the bulk of the trial. See, "Phlox for Sun", for trial results and recommendations for particular cultivars.

The Chicago Botanic Garden also has a large plant evaluation program that evaluates herbaceous and woody plants in comparative trials, ultimately recommending the top performers. See this list of plants that have been comparatively studied. It is a great source to check when you're considering whether to add a particular perennial or shrub to your garden. These Chicago trials have also included monarda and phlox.

See this article from Clemson University Extension for recommendations on how to prevent and treat powdery mildew.

CAN YOU PRUNE TREES AND SHRUBS IN JULY?

For recommended times for pruning particular trees and shrubs, see the Pruning Calendar published by the Virginia Cooperative Extension, which you'll find in *The Garden Shed*, "When to Prune" The general rule is that flowering shrubs that bloom on old wood should be pruned right after flowering. The later they bloom, the later into summer they can be pruned. July is the latest month for pruning many of these spring-to-summer blooming shrubs without removing buds for next year's bloom. Examples include: both deciduous and evergreen azalea, cherry laurel (*Prunus laurocerasus*), mountain laurel (*Kalmia latifolia*), Harry Lauder's walking stick ('*Corylus avellana* 'Contorta'), spring-blooming hydrangea (*Hydrangea macrophylla*), lilac, rhododendron, Carolina allspice or sweetshrub (*Calycanthus floridus*), and deciduous viburnum.

PRUNING EVERGREEN SHRUBS

Evergreen shrubs, such as juniper and yew, are best pruned in late March or early April before new growth begins. **Light pruning, however, may also be done in mid-summer.** Avoid pruning evergreen shrubs in the fall. Fall-pruned evergreens are more susceptible to winter injury. For a helpful guide on different types of evergreens and when to prune, see this article from the University of Delaware, "Pruning Evergreens."

HELPING NEW TREES AND SHRUBS SURVIVE JULY

How much do you water new trees and shrubs, especially as we head into the months of July and August? I have found guidelines from the University of Minnesota Extension to be very helpful:

Newly planted trees or shrubs require more frequent watering than established trees and shrubs. They should be watered at planting time and at these intervals:

- 1-2 weeks after planting, water daily.
- 3-12 weeks after planting, water every 2 to 3 days.
- After 12 weeks, water weekly until roots are established.

Newly planted shrubs are considered established when their root spread equals the spread of the above-ground canopy. Establishment times increase with tree size at time of planting. Refer to the charts included in this article for guidelines on estimated establishment times based on trunk caliper size, as well as watering guidelines based on caliper size. (Caliper size is the diameter of the tree measured at 6" above the ground for trunks 6" or less in diameter, and 12" above the ground for trunk diameters greater than 6".)

JAPANESE BEETLES

July is a peak month for Japanese beetles**. The majority of adults emerge in July,** when (especially on warm, sunny days) adults are easily seen flying around, feeding on fruit and foliage, and mating. Females then lay white spherical eggs 2-6" deep in the soil. Eggs hatch after 8-9 days, and immature grubs then develop in the soil and feed on roots until the weather begins to cool down in autumn. High aggregations of beetles tend to attract other beetles from afar. For this reason, **homeowners are NOT advised to erect commercially available Japanese beetle "traps,"** as they often attract more beetles than they capture.

Traps should be used for monitoring; they will not reduce Japanese beetle abundance or damage to plants. The beetles can feed on the foliage, flowers, and fruit of over 275 different plant species. Some of their favorite ornamental landscape plants are roses, crape myrtle, linden, hibiscus, crab apple, and elm. The beetles "skeletonize" leaves by **feeding on the upper leaf surface and eating tissue between leaf veins.** This gives leaves a lacy appearance. Since beetles are more attracted to each other than to particular plants, homeowners can shake plants to dislodge beetles each morning. Without beetles already on a plant, it is less likely that beetles will aggregate there later in the day. You can also shake the beetles into a tub of soapy water. Removing the buds from plants such as roses can also reduce damage to plants, although this preemptive step may be a bit too drastic for rose lovers. In some settings, flowers or plants can be protected with cheesecloth or other fine mesh.

MOSQUITOES

Reducing breeding sites is the best long-term control for mosquitoes. Eliminate breeding sites in your yard by regularly tipping out any container that holds water. Wash out birdbaths and pet saucers daily; clean out gutters so that they do not hold water; and store buckets and wheelbarrows under shelters where they cannot fill with water. Getting rid of old tires and other debris in your neighborhood will help reduce mosquito populations community wide. Treat pools of water you cannot empty, such as rain barrels, with mosquito dunks. These doughnut-shaped wafers contain a naturally occurring bacterium (*Bacillus thuringiensis* or BT) that kills mosquito larvae before they mature. Mosquito dunks containing BT are effective for around 30 days and are not harmful to fish, birds, mammals, or other wildlife. **Pyrethroid-based mosquito sprays or fogging programs only kill the adult mosquitoes present at the time, and may potentially kill bees, beneficial insects, and pollinators also in the area.**

As Doug Tallamy points out in his book, *Nature's Best Hope* (2019, p.210): "Targeting adult mosquitoes is the worst and by far the most expensive approach to mosquito control, because mosquitos are best controlled in the larval stage."

SUMMER SPOTLIGHT ON TREATING INVASIVES: NON-NATIVE INVASIVE TREES

As reported by Blue Ridge PRISM, **now is the perfect time of year to go after non-native invasive trees** on your land. At this time of year, trees are fully leafed out which means that nutrients move from the treetops into the root system. (During spring, nutrients move upward from roots into the upper branches.) This downward movement transports the herbicide along with the nutrient flow throughout the root system to thoroughly kill the tree and prevent resprouting. You can use three treatment methods to kill invasive trees: basal bark treatment for slender trunks, cut-stump treatment for manageable-sized trees, and hack & squirt treatment for large trees. See the PRISM factsheet titled How To Control Invasive Plants: Manual, Mechanical, and Biological Methods for detailed, how-to instructions on these three methods. Each one requires the application of a concentrated herbicide that will kill the root system.

The worst non-native invasive trees to be concerned about in our region are:

- **Callery pear (***Pyrus calleryana)* and its cultivars, including the Bradford pear (*Pyrus calleryana* 'Bradford'), are now considered to be invasive in 29 states**.** See the PRISM factsheet on ornamental pear trees.
- **Princess tree (***Paulownia tomentosa***),** sometimes called **empresstree** or **paulownia** after its botanical name. See the USDA factsheet on princess tree.
- **Tree-of-heaven (***Ailanthus altissima***),** sometimes called **paradise tree** or **ailanthus**, after its botanical name. **See the** PRISM factsheet **on Tree-of-heaven.**

Tree of Heaven (Ailanthus) Kurt Stuber, Wikimedia Commons (CC BY-SA 3.0)

Princess tree (Paulownia tomentosa), Agnieszka Kwiecien, Nova, Wikimedia Commons (CC BY-SA 4.0)

Callery pear Photo: Richard Gardner, Bugwood.org

INVASIVE JAPANESE STILTGRASS (*Microstegium vimenium*)

Late summer is also the time to attack Japanese stiltgrass. According to the Blue Ridge PRISM Factsheet on Japanese stiltgrass, flowering begins any time from July into October, and seeds ripen and drop to the ground from August to December. It is best to treat small infestations of stiltgrass by manually pulling or cutting. These two methods are most effective when you wait until later in the summer, and finish before the seedheads emerge. Mowing and weed-whacking can greatly reduce seed formation, but only if done correctly. Cut stiltgrass as low as possible, scalping the ground, to remove all flowers. Mowing once in late summer can be as effective as frequent mowing in reducing seed production. Japanese stiltgrass is easily killed with low concentrations of herbicides. Researchers at Virginia Tech showed that a grass-selective herbicide is the most effective control method. When a grass-selective herbicide is used, **more native plants** return than when a non-selective type of herbicide is used. The **recommended time for spraying is from July into early September, and before a particular area of stilt-grass flowers and sets seed.** PRISM refers to the herbicide chart published by the Virginia Department of Forestry for treating non-native invasive species. The PennState Extension website and the NC State Extension are also good sources of information for identifying and treating stiltgrass.

Japanese stiltgrass Photo: Susan Martin

SOURCES

*Nature's Best Hope (*Tallamy, Douglas W., 2019)

"Monthly Garden Tips," Piedmont Master Gardeners, https://pmgarchives.com/gardening-questions/monthly-gardening-tips/#July

"Dividing Perennials," University of Minnesota Extension, https://drive.google.com/file/d/1S6yqog4CnN_zqwG02uiOo28HT-is_LlP/view

"Dividing Irises," PennState Extension, https://extension.psu.edu/dividing-irises

"Powdery Mildew," Clemson Cooperative Extension, https://hgic.clemson.edu/factsheet/powdery-mildew/

"Proper Time to Prune Trees and Shrubs," Iowa State University Extension and Outreach," https://hortnews.extension.iastate.edu/2015/03-13/pruning.html

"Pruning Ornamental Trees and Shrubs," Purdue Extension, https://www.extension.purdue.edu/extmedia/HO/HO-4-W.pdf

"Pruning Evergreens," University of Delaware, https://www.udel.edu/academics/colleges/canr/cooperative-extension/fact-sheets/pruning-evergreens/

"When to Prune," *The Garden Shed*, (March 2017), https://pmgarchives.com/article/when-to-prune/

"Monthly Weather Forecast and Climate, Virginia, USA," Weather-US.com.

"Monarda," Mt. Cuba Center, https://mtcubacenter.org/trials/monarda/

"Trial Garden," Mt. Cuba Center, https://mtcubacenter.org/research/trial-garden/

"Plant Evaluation," Chicago Botanic Garden, https://www.chicagobotanic.org/collections/ornamental_plant_research/plant_evaluation

"Watering Newly Planted Trees and Shrubs," University of Minnesota Extension, https://extension.umn.edu/planting-and-growing-guides/watering-newly-planted-trees-and-shrubs

"Japanese Beetles on Ornamental Landscape Plants," NC State Extension, https://content.ces.ncsu.edu/japanese-beetle-1

"Battling Mosquitoes," NC State Extension, https://chatham.ces.ncsu.edu/2014/08/battling-mosquitoes-2/

"Japanese Stiltgrass Identification and Management," NC State Extension, https://content.ces.ncsu.edu/japanese-stiltgrass-identification-and-management

"Insidious and Formidable Japanese Stiltgrass," Blue Ridge PRISM (Partnership for Regional Invasive Species Management), https://brprismlive.wpengine.com/wp-content/uploads/2017/06/Japanese-Stiltgrass-SAR-5-27-17-VDOF-w-BOX-FINAL.pdf

"Controlling Japanese Stiltgrass in Your Garden," PennState Extension, https://extension.psu.edu/controlling-japanese-stiltgrass-in-your-garden

"Non-Native Invasive Plant Species Control Treatments," Virginia Department of Forestry, https://brprismlive.wpengine.com/wp-content/uploads/2019/06/2018_Nonnative-Invasive-Plant-Species-Control-Treatments_pub.pdf

Feature Photo: July Garden, *Mondarda didyma, Monarda fistulosa,* and little blue stem grass *(Schizachyrium scoparium)* Photo: Susan Martin

Peppers! Peter Piper's Piquant Patience Payoff

By Chris Stroupe | July 2021-Vol.7, No.7

By name – Ají amarillo, Ají dulce, Aleppo, Anaheim, Ancho, Banana, Bell, Cayenne, Cubanelle, Jalapeño, Guajillo, Habañero, Hatch, Hungarian, Pimento, Poblano, Serrano, Tabasco – or by nature – hot, mild, sweet, big, small, long, short, pointy, blunt, straight, curly, red, orange, yellow, brown, white, green, purple, dried, roasted, pickled, raw – peppers are as diverse as they are delicious. And nutritious! One red Bell pepper has more than 100% the USRDA of Vitamin C. This post will explore how to grow peppers in the home garden, from seed to harvest. But first, a little history.

A Potted History of Peppers

Peppers – plants of the genus *Capsicum*, and their fruit – are native to South and Central America and Mexico. Native Americans were eating wild peppers by 7,000 years B.C.E. and had domesticated them by 5,000 B.C.E. The Spanish were the first Europeans to encounter peppers, but the Portuguese were mainly responsible for introducing them to the Old World, via their colonies in Africa, India, and East Asia. The Ottoman Empire brought peppers from India to the Balkans, and peppers then spread into central and northern Europe.

Europeans quickly adopted “pepper” (and its non-English equivalents like “pimienton” and “paprika”) to refer to these plants. Other names derive from Native American languages. “Ají” comes from the Arawak language in the Caribbean. This name is still used in the Caribbean and in South America, particularly to refer to hot peppers. “Chili” and its variants are from Nahuatl, an Aztec language still spoken in Mexico. In some English-speaking countries “chilli” means a hot pepper, whereas non-spicy peppers are called “Capsicums.” “Chile” is used in Mexico – old and New – to refer both to peppers and the country.

The origin of the scientific name *Capsicum* is unknown. It may derive from the Latin *capsula*, meaning chest or box, for the way the fruit encapsulates its seeds. Others believe the name comes from the Greek *kapto,* “to bite”, referring to the fruit’s piquancy. There are about 20 wild pepper species, and five domesticated species: *C. annuum*, *C. chinense*, *C. frutescens*, *C. baccatum*, and *C. pubescens*. The numberless types of domesticated peppers are, botanically speaking, cultivars (or cultivated varieties) of these five species.

C. annuum is far and away the species most encountered in the United States, both in the garden and in the food market: Bell peppers, Jalapeños, and about 3,400 others available from the U.S. National Plant Germplasm System are all cultivars of *C. annuum*.

C. chinense includes Habañeros, as well as the Scotch Bonnet, Bhut jolokia/Ghost pepper, and Carolina Reaper. All of these are famous (or infamous) for their heat, but mild *C. chinense* cultivars also are common, for example the Ají dulce, an essential ingredient in Caribbean and Venezuelan cooking.

The Tabasco pepper is probably the best-known example of *C. frutescens*. Another is the Piri piri, or Bird’s Eye. *C. frutescens* peppers tend to be hot, small, and intensely colored, even when immature, and most ornamental pepper plants belong to this species.

C. baccatum is primarily grown in Bolivia and on the western side of the Andes. Ají amarillo is the most well-known cultivar; it is often ground into a paste that is the backbone of many South American cuisines.

C. pubescens is also popular to the west of the Andes. Its purple flowers and black seeds set it apart from other *Capsicum* species, which have white flowers and cream-colored seeds. The plants also are a little more cold-tolerant than the other *Capsicums*. These peppers are often called *rocoto* or *locoto*, from the Quecha and Aymara languages, respectively, and red varieties are sometimes called *manzano*, Spanish for “apple.” The similarity to apples is 100% cosmetic, though: *rocotos* can be as hot as Habañeros.

Hot stuff

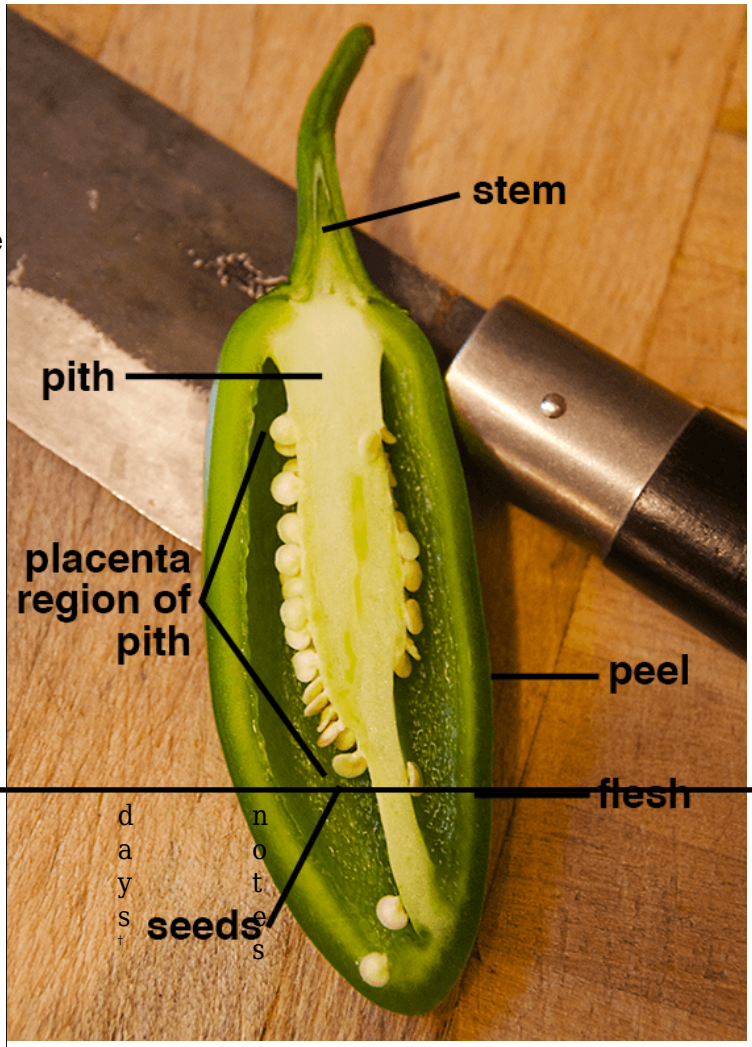
Capsaicin is the chemical responsible for peppers’ heat. (Technically, it’s one of six similar compounds in peppers, but it is the most prevalent by far.) It’s not just poetic license to call the sensation generated by capsaicin “heat”: capsaicin stimulates sensory neurons that also respond to high temperatures. Mammals sense capsaicin but birds do not. It’s hypothesized that this is an evolutionary strategy to ensure seed dispersal by birds, which do not have teeth that can destroy pepper seeds.

Capsaicin is not very soluble in water, but it is quite soluble in oils and fats. Cooks can take advantage of this to ensure maximum capsaicin delivery. If less heat is desired, though, using fewer or milder peppers is probably more satisfying than using less butter or oil. Wash hands, knives, cutting boards, etc. that have come into contact with hot peppers, using soap and hot water to remove any traces of capsaicin.

The glands that make capsaicin are in central pith of the pepper, especially in the placenta where the seeds are attached (see photo). Sadly for gardeners whose plants are targets of deer and

other mammals, there is no capsaicin in leaves. Seeds also do not contain much capsaicin, though they are often said to. When using peppers in a recipe, cooks can dial up or down the heat level by incorporating more or less of the pith.

Peppers' heat level is measured using the Scoville scale, which was developed in the early 20th century by Wilbur Scoville, an American pharmacist. The basic method is to extract capsaicin from peppers using alcohol, then dilute in sugar water until heat can no longer be detected by a taster. The level of dilution is then the number of Scoville units. Peppers range from 0 units (Bell) to about 2 million (Carolina Reaper, according to Guinness World Records in 2017). Pure capsaicin comes in at 15-16 million Scoville units. The following table lists several common pepper varieties and their Scoville levels.



Some internal structures of a pepper; the capsaicin glands are found in the pith. Photo: Chris Stroupe

Pepper varieties

name (species*)	Scoville units	days†	notes

Ají amarillo (b)	30,000-50,000	60	paste is ubiquitous in Peruvian cooking
Ají dulce (c)	0-500	100	fruity flavor of Habañero but no heat
Aleppo (a)	15,000	70	slightly smoky flavor

Anaheim (a)	500-2,500	80	hotter when red
Ancho (a)	1,000-2,000	75	dried Poblano; popular in Mexican cooking
Banana (a)	0	70	good alternative to Bell for home gardeners

Bell (a)	0	70-80	red, orange, or yellow when ripe
Bhut jolokia (hybrid of c, f!)	1,000,000	100	name can be translated as “ghost pepper”
Carolina Reaper (c)	1,400,000-2,200,000	100	as of 2017, world’s hottest chilli

Cascabel (a)	1,500-2,500	80	usually dried; seeds rattle
Cayenne (a)	30,000-50,000	70	thin, 2-5” long; often dried and ground
Cherry (a)	0-500	75	often pickled; also known as Pimientos

Chile de arbol (a)	30,000-50,000	70	vigorous and high-yielding plants
Chipotle (a)	2,500-8,000	80	smoked red Jalapeño; often canned in adobo
Cubanelle (a)	100-1,000	60	delicious when sautéed

Fresno (a)	2,500-10,000	75	similar to Jalapeño but hotter and sweeter
Guajillo (a)	2,500-5,000	70	dried Mirasol; common in Mexican cooking
Habañero (c)	100,000-350,000	95	has it all: fruity flavor, searing heat

Hatch (a)	0-100,000	75-80	New Mexico chiles grown in Hatch Valley
Hungarian Wax (a)	1,000-15,000	60	usually picked before ripe; yellow-green
Jalapeño (a)	3,500-8,000	80	become sweeter (but still hot) when ripe

Mirasol (a)	2,000-5,000	70	point upwards on plants, thus the name
New Mexico (a)	0,000-100,000	75-80	“Red or green?” is the NM State Question
Pepperoncini (a)	100-500	80	usually picked green and pickled; a bit sweet

Pimiento (a)	100-500	80	often pickled; a little sweet; aka Cherries
Poblano (a)	1,000-1,500	75	fresh Ancho; frequent in Mexican cooking
Scotch bonnet (a)	100,000-350,000	95	similar to a Habañero

Serrano (a)	10,000-20,000	75	similar to Jalapeños but smaller and hotter
Shishito (a)	50-200	60	popular appetizer when charred on a skillet
Tabasco (f)	30,000-50,000	75	brilliant color, lots of heat; used in the sauce

*, a: *C. annuum*, b: *C. baccatum*, c: *C. chinense*, f: *C. frutescens*

†, days after transplanting outside until green peppers can be harvested in central Virginia

Sources: "Heirloom Pepper Varieties for Florida", Florida Cooperative Extension Service; "Michigan Fresh: Hot Peppers", Michigan State University Extension; Southern Exposure Seed Exchange 2021 Catalog and Garden Guide (PDF); Wikipedia, List of Capsicum cultivars

Cultivation

If you're just getting started growing your own peppers, you'll want to choose from the cultivars recommended by experts, and many of them are noted above. Here's a list to get you started:

Recommended Cultivars (Clemson Coop.Ext./Pepper)
Bell Peppers: Capistrano, Jupiter, Plato, Antebellum, Valencia, Vanguard
Banana Peppers: Sweet Banana, Cubanelle, Banana Supreme, Biscayne, Key Largo
Jalapeño: Jalapeño M, Tula, Mitla, Fooled You
Habañero: Habañero, Tiger Paw NR
Cayenne: Carolina Cayenne, Charleston Hot, Long Slim Cayenne, Super Cayenne II
Other Hot Peppers: Carolina Reaper, Ghost Pepper, Scotch Bonnet, Poblano/Ancho, Serrano

Many highly-recommended cultivars are disease resistant, so you'll likely want to look for this feature. See https://extension.umn.edu/news/disease-resistant-bell-peppers-good-choice-home-gardens.

Seed starting: Peppers are easy to start from seed. Begin by finding a good source: most seed companies, both local and national, offer a huge variety of pepper seeds. Seed exchanges (e.g. Seedsavers.org) are also a great option. The enormous number of pepper varieties might be daunting at first, so it's probably best to start with just a couple of varieties, maybe one hot and one sweet. The above table, which lists some common varieties, might be helpful.

Pepper seeds germinate slowly, so get started 6-8 weeks before the last frost. Average frost-free dates in Virginia can be looked up here. (For locations outside Virginia, use the NOAA Climate Data Online Search. Download the data for a weather station and find the spring and fall dates with a 50% chance of reaching 32°F.)

Start the seeds in potting mix or in a mix specifically designed for seed-starting. Put the dry mix in a container – e.g. a flat with wells (wash it thoroughly if re-using) or an egg or yogurt carton (poke a couple of holes in the bottom) – and moisten completely, until a little water comes out the bottom. Put 2-5 seeds, depending on the size of the wells, on top of the mix. Cover with about ¼" of dry mix. Gently moisten the added mix with a spray bottle.

Pepper seeds germinate best between 75°F (24°C) and 85°F (29°C), so a heated mat is a good investment. It's also a good idea to put the potted seeds in a secondary container, whether a tray designed to hold flats or a shallow tub with a flat bottom, to hold any water that comes out of the container holding the seeds.

Put a cover over the secondary container to keep the environment moist. The cover can be a piece of glass or

plastic wrap, or a plastic dome made for seed-starting, but either way, be sure there's enough room for the seedling to emerge. Ideally, watering won't be necessary before the seeds germinate. If water must be added, only use enough to keep the seed-starting mix moist, not soggy. Otherwise, the seeds may rot. If possible, add water directly to the secondary container and it will wick up into the seed-starting mix.

***Seedling care**:* Uncover the seedlings once most of the seeds have germinated. This will reduce humidity and prevent fungal diseases. "Damping-off", when the stem wilts and dies at the soil line, is the main danger for new seedlings. It's more or less impossible to stop damping-off once it's begun, so prevention is key. If possible, aim a fan at the seedlings. This has two benefits: it will keep the seedlings dry, and the force of the air against the seedlings will stimulate them to grow stronger.

Continue to water the seedlings as before, just enough that the planting mix is moist but not sodden. This will also help prevent disease.

Natural sunlight won't be strong or plentiful enough for robust growth, particularly in the winter. Fluorescent tubes and bulbs are very effective as artificial lighting, but it's important to choose the right ones. Seedlings respond best to blue light. In practice this means the "color temperature" of the light source should be 5000 K or 6500 K, and 4100 K at the very minimum. (Another way to put this: "cool white" bulbs/tubes are OK, but "daylight" and "full spectrum" are much better.) LED's are fine, but the added expense might not be worth the longer lifetime. Along the same lines, any improved outcomes from "grow lights" probably don't justify the extra cost.

The light source should be as close as possible to the seedlings, but not so close that the seedlings overheat. Ideally, the light source should be directly above the seedlings. The fixture could be suspended from the ceiling or a wire shelf positioned over the seedlings. Stands built from PVC tubes are another good option. Raise the light source as the seedlings grow. Illuminate the seedlings for 12-16 hours a day.

Needless to say, buying pepper seedlings from a garden center or farmers market is absolutely OK!

***Transplanting**:* Transplant seedlings fairly early on into individual 3" pots filled with potting mix. The exact timing will depend on how densely the seeds were sown. If the seedlings are closely spaced, transplant once the first set of true leaves develop, i.e. after the cotyledons that appear with the new seedlings. If less dense, it's fine to wait until the 2nd or 3rd set of leaves appear. But do not delay much longer than this, or the seedlings will become "leggy", i.e. tall, thin, and weak. Peppers grow best when their roots are not too crowded. If necessary, transplant the seedlings again into larger pots.

When the last predicted frost-free day arrives, the next step is to…wait. Peppers grow best in warm soil. Nothing is gained by planting them before the soil temperature has reached about 65°F (18°C). In the meantime, "harden off" the seedlings by putting them outside for a few hours a day at first, gradually increasing the time over the course of a couple of weeks. Be judicious about weather conditions, i.e. don't set out the seedlings during a cold snap.

Peppers need a lot of sun – 8-10 hours per day is best, 6 hours at bare minimum – so choosing the right spot for the plants is critical. Don't plant peppers where trees or taller plants will shade them. Orient rows north-south so that plants won't be in the shadows of neighboring rows.

Remove weeds from the area to be planted. Loosen the soil with a spade, pitchfork, or broadfork. If the soil is dense clay or loose sand, incorporate 4" of compost into the top 12" of soil at this time. This is a lot of compost, ⅓ cubic foot per square foot of area, but the improved drainage and aeration will be worth it. Work fertilizer into the top couple of inches of soil with a garden rake. Ideally, have the soil tested to determine how much to add. (It's perfectly fine to use a general-purpose fertilizer like 10-10-10, though. Apply about 3

oz. per 100 sq. ft.) A soil test will also measure the soil pH, i.e. acidity. The report will contain instructions for raising the pH with lime or lowering it using sulfur. Peppers grow best at a pH between 5.5 and 6.5. (See Ralph Morini's April 2021 article for more about bed preparation.)

Jalapeño plant in the garden. Peppers also grow well in containers! Photo: Chris Stroupe

Peppers should be planted 18-24” apart, in rows 30-36” apart. Dig holes a bit larger than the containers the plants are growing in, and loosen the soil in the bottom of the holes. Gently remove the plants from their pots and loosen their roots a little, especially if they’re very dense. Put one root ball in each hole, deep enough that the first set of leaves is an inch or two above the soil level. (Peppers, like tomatoes, can grow “adventitious” roots out of their stems.) Fill the holes with soil and firmly but gently press it into place. The goal is to ensure good contact between soil and roots without compacting the soil too much. Add a cup of “starter solution” that’s high in phosphorous around the base of each transplant. A general recipe for a starter solution is 4 Tbs. of a 3-10-3 liquid fertilizer diluted in 1 gallon of water. Finally, water the transplants thoroughly.

Plant support, fertilization, and irrigation Domesticated peppers do not have very strong stems, so it’s usually necessary to support the plants. Tie stems to 3’ stakes driven into the soil about 4” from the plant. It’s a good idea to place stakes at the time of planting, to avoid damaging the roots. Another good option is the “Florida weave”, in which twine is run up and down the row, passing back and forth between each plant. Wrap the twine around stakes at the ends of the row and every 3-4’ along the row. (This video shows the process.)

Peppers are fairly light feeders; that is, they do not require much fertilizer as they grow. A little extra nitrogen may be helpful after the first fruits appear if “vegetative growth” (i.e., stems and leaves) isn’t vigorous. Add 3 Tbs. of a 33-0-0 fertilizer per 10 feet of row, 6-8 inches on either side of the plants. Don’t add more than this, or the plants will make too many leaves and not enough flowers and fruit. And be sure to wait until fruits have appeared, for the same reason.

Peppers also have a moderate need for water. Aim for a total of 1 inch of water per week, which works out to about 0.6 gallons or 2.5 quarts per square foot (or 25 liters per square meter). It’s best to keep the moisture level in the soil fairly consistent; that is, don’t let the soil dry out too much.

Mulch will help to keep soil moist. Straw – not hay, which is full of seeds – and grass clippings make great organic mulches. Black or red plastic – the reflected red light stimulates flowering and fruit production – work well also, but can overheat the soil. White plastic may cool the soil a little. Transparent plastic will almost certainly overheat the soil, but might be useful for extending the growing season in colder climates.

Weeds, pests, and diseases Mulch is also an easy way to keep weeds down. Mulched or not, the bed should be kept thoroughly weed-free to avoid competition for water and nutrients. Hand-weeding will work fine for a small area, but a hoe will make the job much easier. A “stirrup hoe” is a great tool for weeding just under the soil, which will avoid damaging the deeper roots of the peppers.

Pests affecting peppers include insects such as aphids, corn earworms, cutworms, and flea beetles, mammals like deer and groundhogs, and root nematodes, which mostly affect bell peppers. The table below details the appearance of these pests, signs of their damage, and a few methods for control. Agricultural extension agents can provide more advice about pesticides and their use.

Pests of peppers

name	appearance	signs	control

aphid	very small, clustered, usually green/black	curled leaves, sooty mold on leaves	pymetrozine, insecticidal soap
corn earworm	1″ long, pink-white with dark spots	fruit damage	methoxyfenozide*†, B.t.*
cutworm	≥1” long, dark; curl up when disturbed	damaged stems at soil line	paper/foil collars around plant base, methoxyfenozide*†, B.t.*
flea beetle	small, dark or striped	many tiny holes in leaves	diatomaceous earth
mammals	furry, large or small	clipped leaves and stems	physical barrier
root nematodes	very small (≤1 mm)	stunted or wilted plants	resistant varieties

*, keep spray away from butterfly habitat
†, moderate bee toxicity; spray only in evening when bees are less active
Sources: *Home Grounds and Animals 2021 Pest Management Guide* (Virginia Cooperative Extension); “How to control invasive pests while protecting pollinators and other beneficial insects”, Michigan State University Extension; *Master Gardeners Handbook: a Guide to Gardening in Virginia* (Virginia Cooperative Extension, 2015); “Pesticides and Bee Toxicity”, Minnesota Dept. of Agriculture.

Always follow the directions on pesticide labels. Also note that even organic pesticides can hurt beneficial insects like butterflies and bees. So be sure to keep products that can be harmful to butterfly larvae, like B.t., away from butterfly habitat. Spray products that are toxic to bees only in the evening, when bees are less active.

The most common diseases affecting peppers are anthracnose, bacterial spot, and tobacco mosaic virus. Prevention via sanitation is the best way to avoid these diseases, which are difficult or impossible to treat once established. Remove and destroy infected plants immediately. Promptly remove fallen leaves, stems etc. during the growing season, and remove all plants and plant debris at the end of the growing season.

Proper growing methods can also prevent disease. Water plants at the base to keep leaves dry, but don’t splash too much dirt onto the plants. Space plants appropriately (18-24” apart in rows 30-36” apart) to promote air circulation. Rotate plantings so peppers aren’t grown where peppers or their relatives, potatoes and tomatoes, were planted the previous year.

These practices can be supplemented by fungicides and bactericides, particularly if neighboring plants are infected. See the table below for details. Agricultural extension agents also are a great source of information regarding chemical disease controls. Always follow the instructions on the labels for both organic and conventional fungicides and bactericides.

Diseases of peppers

name	symptoms	control
anthracnose	dark water-soaked spots on fruit	sanitation, mancozeb*

bacterial spot	tiny dark spots on leaves and fruit, yellow leaves, leaf drop and sun-damaged fruit	sanitation, copper-based bactericides
tobacco mosaic virus	stunted plants, yellow mottling on leaves	sanitation

*, personal communication, Steven Rideout, PhD (Professor/Extension Specialist of Plant Pathology, Virginia Tech)
Sources: *Home Grounds and Animals 2021 Pest Management Guide* (Virginia Cooperative Extension); *Master Gardeners Handbook: a Guide to Gardening in Virginia* (Virginia Cooperative Extension, 2015)

Harvest: Peppers have a long growing season. Depending on the species and cultivar, the minimum time for green peppers is about 60 days after planting outside, and can be as long as 90 or even 100 days. Most varieties bear green peppers in 70-80 days. Fully ripe peppers, i.e. red, yellow, or orange, take an additional 2-3 weeks. These times, of course, also depend on temperature and sunlight. The first table above — "Pepper varieties" — lists times after transplanting until green pepper harvest.

Harvest peppers by cutting the stems of the fruit with clippers or scissors. Stems are usually attached firmly to plants, so yanking or twisting can damage fruit and/or plant.

Seed-saving: Seeds from ripe fruits germinate best. If working with hot peppers, wear gloves and eye protection. Harvest the fruit and cut off the top and bottom. Cut the fruit in half and separate the seeds from the placenta. Break up any clusters into individual seeds. Spread the seeds on a smooth surface. Don't use a paper towel or the seeds may stick or even germinate. Allow the seeds to dry for a few days, or up to a week. Jostle the seeds every day or two to ensure even drying. Carefully running a fan across the seeds may speed things up. The seeds are dry when they are brittle, i.e. when they break when bent.

Keep seeds cool and dry. A sealed jar or plastic tub in the refrigerator is a great option. A desiccant like silica gel may be helpful. Small envelopes or plastic bags can be used to hold seeds from different varieties. It's also a good idea to note the variety and date on the container. Properly stored, seeds will be viable for two years, though probably not much longer.

For better or worse, saved seeds won't necessarily yield peppers identical to the parent plant. Peppers self-pollinate well, but cross-pollination is quite possible. And even when self-pollinated, hybrid (i.e. F1) peppers' seeds usually produce utterly different plants. Open-pollinated cultivars, which includes most "heirloom" peppers, are bred to be the same from generation to generation – when self-pollinated. The rule of thumb is that cultivars should be separated by 300 feet to prevent cross-pollination. Depending on goals and outlook, this can be a problem or an opportunity!

Final thoughts

Also a problem and opportunity: healthy pepper plants will yield a lot of fruit, up to 8 lb. per 10-foot row. It's likely there will be ripe peppers on the plants when frost arrives. Be sure to check out next month's issue of the *Garden Shed* for some amazing recipes featuring peppers.

And above all, have fun! Peppers are a delicious, versatile, and nutritious crop with a fascinating history. They're easy to grow and high yielding, and make a fantastic addition to any home garden.

PESTICIDE WARNING
Pesticides (which include herbicides, insecticides, rotenticides, etc.) are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock. Consult the pesticide label to determine active ingredients, signal words, and proper protective equipment. Pesticides applied in your home and landscape can move and contaminate creeks, lakes, and rivers. Confine chemicals to the property being treated and never allow them to get into drains or creeks. Avoid drift onto neighboring properties and untargeted areas.

References and further reading

Home Grounds and Animals 2021 Pest Management Guide (Virginia Cooperative Extension), Pest Management Guide 2021/Va.Coop.Ext.

Master Gardeners Handbook: a Guide to Gardening in Virginia (Virginia Cooperative Extension, 2015)

Peppers, the Domesticated Capsicums (Jean Andrews, 1984)

"Growing Peppers in the Home Garden," ohioline.osu.edu

Pepper/Univ.of Maryland Ext.

"Heirloom Pepper Varieties for Florida", Florida Cooperative Extension Service

"How to control invasive pests while protecting pollinators and other beneficial insects," Michigan State University Extension

"Michigan Fresh: Hot Peppers," Michigan State University Extension

"Pesticides and Bee Toxicity", Minnesota Dept. of Agriculture

"Plant Propagation from Seed", Va. Coop. Ext. Pub. 426-001

"Saving Vegetable Seeds", University of Minnesota Extension

https://en.wikipedia.org/wiki/Capsaicin

https://en.wikipedia.org/wiki/Capsicum

https://en.wikipedia.org/wiki/Capsicum_annuum

https://en.wikipedia.org/wiki/Capsicum_baccatum

https://en.wikipedia.org/wiki/Capsicum_chinense

https://en.wikipedia.org/wiki/Capsicum_frutescens

https://en.wikipedia.org/wiki/Capsicum_pubescens

https://en.wikipedia.org/wiki/Scoville_scale

The Edible Garden in July

By Ralph Morini | July 2021-Vol.7, No.7

We are entering July following a June that was hotter and drier than average. This has required more watering than usual and caused cool weather crops to bolt quickly. On the other hand the soil is warm, and heat-loving summer crops like squashes, melons, sweet potatoes, and eggplants are off to a good start. Flexibility in plant selection and planting timing is key to optimizing results given the weather's unpredictability.

Planting and Harvesting

As you transition from spring to summer crops and later from summer to fall, be sure to maintain good soil hygiene by removing spent and diseased plant material. Prune and space plants to allow for good air circulation. Water at the base of plants, in the morning, and avoid splashing soil on plants. A light straw or leaf mulch can help prevent soil splashing while helping to conserve soil moisture if weather continues to be hot and dry.

If you planted cool weather crops in the early spring, they have likely completed their life cycles. This typically includes greens and cole crops, although, with luck, you may be harvesting the last of your broccoli

and chard. Clean the garden of spent plants, perhaps leaving a few uneaten lettuces and herbs to flower, which will draw pollinators and beneficial insects to the garden. The removed plants can be composted if not diseased and if they haven't set seed. Otherwise, it is best to dispose of them.

There is still time to plant summer vegetables including beans, okra, pumpkin, sweet potatoes, cucumbers, peppers, squash, corn, eggplant and tomatoes.

Late July into August is the time to make a fall planting of your favorite cool weather vegetables. Amend soils now by adding mature compost and organic fertilizer to the top couple of inches of soil to give soil life the time to make nutrients plant-accessible. Crops that can be planted at the end of July include broccoli, brussels sprouts, cabbage, carrots, cauliflower, collards, leeks, and rutabaga.

For a comprehensive listing of recommended planting times for your hardiness zone, refer to Extension Publication 426-331, Virginia's Home Gardening and Vegetable Planting Guide.

Advice for Tomato Growers

Tomatoes are a prized summer crop for many of us. It is best to support plants with stakes or cages. If you use **stakes** (I use half inch rebar, but wood is commonly used), tie plants loosely to the stake with a soft twine or cloth strip. Add ties to give needed support as plants grow and fruits develop. Prune lower leaves that touch the ground to reduce susceptibility to soil pathogens. Allow up to two main stems and pinch off all other "suckers" that sprout at leaf/stem intersections to focus the plant on fruit production rather than vegetative growth.

Tomato sucker: Photo Ralph Morini

Pinch off “suckers” where leaf and stem join to focus tomato plants on fruit production

Cages require more upfront investment and off-season storage space, but reduce plant maintenance time during the growing season. If you use cages, prune plants to 3 or 4 main stems. The additional vegetation will help protect fruit from sun scald.

In all cases, remove any diseased foliage quickly with shears disinfected with a 10% bleach solution. Best to bag and remove diseased vegetation with your trash. Mulching with straw helps maintain moisture, hold down weeds, and reduce soil splash during watering.

A more complete guide to growing tomatoes is provided in Extension Publication 426-418, titled “Tomatoes.”

Summer Pests

Summer is the peak activity period for many garden pests. Here is some information about a few common ones:

Slugs: A run of wet weather in the summer tends to cause slugs to proliferate. Besides handpicking them where leaf damage signals their presence, improving air circulation by thinning heavy mulches and pruning and spacing plants can help manage them. Sprinkling diatomaceous earth or crushed egg shells around plant bases can create a barrier to slugs reaching plant stems. Toads are a natural predator, so creating a toad house nearby may also help. Other deterrents include placing a pan of beer with edge at soil level, inviting them to slither in and drown, or placing a partial melon rind upside down on the ground overnight, then collecting the rind and overstuffed slugs in the morning for disposal.

Striped cucumber beetle. Photo: Melissa McMasters, CC BY 2.0

Cucumber Beetles: Adult cucumber beetles emerge in late June/early July. Striped and spotted varieties can damage flowers, foliage, and roots of cucurbit family plants. They are also a vector for bacterial wilt disease. Control them with row covers, by hand picking, and good garden hygiene. For serious infestations, additional measures are outlined in Extension Publication 2808-1009, "Cucumber Beetles."

Squash bug nymphs and adult. Photo: Lisa Zins, CC BY 2.0

Squash Bugs: Squash bug nymphs and adults can attack any cucurbit but prefer squashes and pumpkins. They pierce plant tissue and suck liquids out, while injecting a toxic substance into the plant that causes vines to wilt and die. A board on the ground near vines offers overnight shelter to the bugs which can be collected and dropped into soapy water in the morning. Maintaining good biodiversity can also help. The tachinid fly attacks squash bugs and can help control modest infestations. Details are available in NC State Extension Publication: "Lookout for Squash Bugs."

Adult squash bug. Photo Helene Doughty, Va. Polytechnic Institute & State University, Bugwood.org

Stink Bugs: Brown marmorated stink bugs will attack a variety of plants including tomatoes, peppers, beans, cucurbits and sweet corn. They suck liquids from leaves causing spots and wilting. Handpicking, good hygiene, and minimizing wood mulches can help control them. Companion planting with chives, onions, garlic, radishes, nasturtiums, marigolds, bee balm, and dill also deter infestations. Again, beneficial insects, namely the tachinid fly, prey on the bugs

and are helpful. Tachinid flies are not available commercially, so build a diverse ecosystem around the garden to attract them.

Cross stripped cabbage worm with frass. Photo: NC State Extension

Cabbage worms: During the past few years my gardens have had serious infestations of the larva of imported cabbage moths and cross-striped cabbage moths that have decimated my kale and collards. This year I protected them with a row cover in early May and am happy to report that the greens have grown well with virtually no damage. Because we are approaching fall planting time for these crops and since the moths and larvae are active until frost, this measure may be of interest if you have struggled with these pests. Simple and inexpensive row cover ideas are explained in the November 2019 *Garden Shed* article "Row Covers: A Season Extender with Benefits".

If you want help identifying an insect, try the University of Georgia Extension video Garden Insects: Friend or Foe. A good source to determine treatments for identified pests is the Cornell Extension's Resource Guide for Organic Insect and Disease Management.

Other ideas to help maintain garden health during July:

- **Watering is** extra important in the hotter months, for overall plant health, and for the taste and texture of many vegetables. The garden typically needs about an inch of water per week, more during very hot periods. Early morning is the best time to water. It's cool so it minimizes evaporation and gives leaves time to dry before dark, reducing susceptibility to fungal diseases. Mulching with straw can stabilize soil moisture and help hold weeds down.
- As we become more sensitive to water as a critical resource in short supply, use of rain barrels is increasingly attractive. They can reduce runoff, conserve water resources, and reduce water/sewer bills. Natural rain water is also better for plants than chlorinated water. They are placed under downspouts. Rainwater passes through the downspout to a diverter that sends it to the barrel. When the barrel is full, the water is sent back down the downspout. Rain barrel water isn't considered potable and can pick up pathogens from fecal matter on roofs, so should be applied to the base of plants, not sprayed on foliage. The benefits of rain barrels are discussed in the publication Rain Barrels from the Penn State Extension.

Weeding with a stirrup hoe. Photo: Wayne Stratz, CC BY NC SA 2.0, Flickr.

- It's important to **control weeds** around vegetables because weeds can out-compete vegetable plants for nutrients, water, and sunlight. The best method of control is by mechanical extraction, meaning good old-fashioned weed-pulling or the use of a hoe. For small weeds, the "**hoop" or "stirrup" hoe** is highly recommended because it allows for shallow cultivation.
- Another plus for the hoop or stirrup hoe: it doesn't bring weed seeds to the surface of the soil! Deep cultivation often brings seeds to the surface of the soil, facilitating germination of a new crop of unwanted weeds.

Fusarium wilt of basil (Fusarium oxysporum, f. sp. basilicum). Photo: Debbie Roos, NCSU Agricultural Extension Agent

- **Fusarium wilt of Basil** is a fungal disease specific to sweet basil. The fungus attacks the water-conducting tissue (xylem) within the stem. Infected plants will grow normally until they are six to twelve inches tall. Then the plants suddenly wilt. The stem may become curved and develop brown streaks. The fungus can over-winter and survive many years as spores, ready to cause new infections in basil or other members of the mint family that are planted in the same soil. There is currently no fungicide approved for its treatment, but it can be controlled somewhat by removing diseased plants, by rotating planting locations, and by planting disease-resistant varieties. Additional information is available at edu/-fusariumbasil.
- **Okra blossoms are** one of the showiest blooms in the vegetable garden, but they only last one day. Keep an eye open for them if you don't want to miss them. If the flower has been pollinated, a miniature okra pod can be seen beneath the wilted flower.
- **Cucumbers** develop a **bitter taste** if the soil is not kept **consistently moist.** Leaf mulch will help maintain soil moisture.
- **Harvest cucumbers** for pickling when they reach 2-4 inches in length; for table use, harvest when no longer than 5-6 inches. Remove over-ripe cucumbers to encourage continuous production.
- **Withhold water on potatoes when the plants begin to die down.** Water and fertilizer may disturb the dormancy stage and cause regrowth, and may also cause potatoes to crack.
- If you use **insecticides on vegetables**, always check the label to understand how much time you need to wait before safely harvesting and eating.

For more tips on a variety of gardening topics, check out the **Monthly Gardening Tips** listed on the PiedmontMasterGardeners.org website under Gardening Resources.

I hope you find this information helpful and look forward to sharing ideas again next month.

Sources:

Virginia's Home Garden Vegetable Planting Guide: Recommended Planting Dates and Amounts to Plant

"Weeds in the Home Vegetable Garden," Virginia Cooperative Extension Publication No. 426-364, pubs.ext.vt.edu/426/426-364

"Basil Problem," NC Cooperative Extension. https://growingsmallfarms.ces.ncsu.edu/growingsmallfarms-fusariumbasil/

Citizen Science

By Penelope Fenner-Crisp | July 2021-Vol.7, No.7

By PENNY FENNER-CRISP

Do you have an inquiring mind? Are you interested in learning new things? Especially about horticulture and the environment that can yield benefits both for your own household and for your community?

A park ranger and kids examine an intertidal rock. Photo: Katie Petrie, National Park Service.

Have you ever thought about how much fun and fulfilling it would be to participate in a research project designed to advance scientific knowledge that might help you achieve further success in your gardening endeavors, all the while protecting the integrity of the greater environment in which you live? If this idea appeals to you, consider becoming a Citizen Scientist. You won't have to go back to school. You don't have to have a science degree. You just need to be nosy—uh, inquisitive.

So, what is Citizen Science?

As defined by the National Geographic Society, it is "the practice of public participation and collaboration in

scientific research to increase scientific knowledge. Through citizen science, people share and contribute to data monitoring and collection programs." Generally, the research projects are led by scientists in academia, government and many kinds of non-governmental organizations, often in partnership with one another. On occasion, it is the citizens themselves who identify a problem and start the ball rolling as advocates for themselves and their communities. Think of the Flint, Michigan lead-in-the-drinking-water situation as an example. Much of the funding for the projects comes from government, but other sources may be available, depending upon the situation and the nature of the scientific question to be answered.

How can you find a project you or members of your family might wish to participate in?

There are citizen science project databases available to search online. They allow you to filter choices by topic, active or not, recruiting volunteers or not, geographic scope (state, national, global) age group suitability, and mode of participation (e.g., as an individual, with a group, online, etc.). Start looking for a project in one of the following databases:

National Geographic Society

This site currently lists 24 projects, many of which focus on monitoring populations of birds, butterflies, frogs and toads, and wildflowers. It also contains a link to Connect with Your Community, which lists some initiatives related to environmental stewardship.

SciStarter

This website lists over 1600 projects, representing many different areas of science. It provides a Project Finder filter so you can select ones of most interest to you.

CitizenScience.gov

This database lists nearly 500 citizen science projects funded by the federal government. Many of them also are catalogued in SciStarter. This database also includes projects representing a broad swath of scientific disciplines. This site has the added feature of being able to sort by agency lead, so you can target your search to those most relevant to your gardening/horticulture and environmental stewardship interests such as USDA, EPA, and the Fish and Wildlife or Forest Services.

What if you cannot find a project that appeals to you?

Can't find a match? But you still have scientific questions you cannot find answers to in the existing literature? Well, then, plan and conduct your own research. Some federal agencies which support citizen science and crowdsourcing programs, incorporating the results from these efforts into the analyses of their own work, also provide funding for citizen-initiated projects.

To be sure, this path is not effortless or for the faint-hearted. There are challenges in competing for grant money. BUT— think of the satisfaction you will feel, knowing that you are contributing to the scientific knowledge base in areas in which that you are personally invested.

Space does not allow for describing all the possibilities, but I will provide two examples—the Forest Service of the U.S. Department of Agriculture and the U.S. Environmental Protection Agency (EPA).

The Forest Service Citizen Science – Resources webpage contains a section on designing a project. This section lists six key resources that, collectively, will provide the background and guidance for designing, conducting and reporting on your own work:

1. The Cornell Citizen Science Toolkit

2. CitSci.org

3. Do-it-yourself BioBlitz

4. ESRI Citizen Science Resources

5. Anecdata.org

6. SciStarter Citizen Science Platforms Report

The quest for information on EPA's Citizen Science activities begins on its webpage entitled "Citizen Science for Environmental Protection." Here you will not only find information on projects already underway, but also how to get involved in project design and implementation.

The EPA also provides several resources to get you off on the right foot:

1. Citizen Science Central Toolkit

2. Community-Based Monitoring of Alaska's Coastal and Ocean Environment: Best Practices for Linking Alaska Citizens with Science

3. Extreme Citizen Science: ExCiteS

As an added bonus, in some cases when EPA is providing the funding, the agency offers equipment, analytical and other tools, and technical expertise to the communities receiving those monies.

Is the thought of planning and executing your own project a bit overwhelming at the moment?

If so, let's step back a bit and proceed more cautiously—and stay local.

The VA Department of Environmental Quality conducts sampling of surface waters all across the Commonwealth. Results show that over half of the waterways in Albemarle County are considered to be impaired. The County has established the Stream Health Initiative with the goal of developing strategies for improving stream health in Albemarle County using a collaborative and inclusive process. There are a variety of roles for the public to play in the implementation of this project, depending on an individual's interests and expertise.

Citizen scientist sampling a stream in Great Smoky Mountains National Park. Photo: National Park Service.

And, over on Grounds at UVA, in the biology lab of Dr. Alan Bergland, the second

Backyard Evolution project training video shows how to sample flies in your compost pile. Bergland Lab, UVA.

year of the Backyard Evolution Citizen Science project is underway and looking for volunteers for the 2021 season (July-December). This project aims to collect drosophilid flies from compost piles throughout the growing season in order to examine the flies' adaptive evolutionary changes. This work is being carried out as a collaboration between Virginia Master Gardeners and Master Naturalists, Piedmont Virginia Community College, and the University of Virginia. If you are interested in participating

, click here.

Speaking of the Master Naturalists…

The Rivanna Chapter of the Virginia Master Naturalists is based near Charlottesville but is also active in Albemarle, Fluvanna, Louisa and Nelson counties. Among their ongoing projects are nearly 30 categorized under "Citizen Science." No specific details of the projects are provided in the on-line listing and there is no information as to how members of the public might become involved. However, if you're interested in finding out more, here is their contact information:

> Rivanna Master Naturalists, P.O. Box 8284, Charlottesville, VA 22906, rivannamn.info@gmail.com | (434) 872-4580.

And, speaking of the Master Gardeners….

The Piedmont Master Gardeners (PMG), which encompasses the Albemarle County/Charlottesville area of central Virginia, has an active citizen science project underway for which volunteers are being recruited. It is the Citizen Scientist Detection Program for Spotted Lanternfly in Virginia.

The Albemarle/Charlottesville Chapter is coordinating the detection and monitoring program in this area, partnering with, and reporting data to, the Insect ID Lab at Virginia Tech. Volunteers will be trained and provided trapping materials to be placed on the trunks of ailanthus trees, one of their top food choices. Grape vines and many trees with significant ecosystem and economic value are also on their menu; hence, the importance of tracking this pest.

If you are interested in volunteering or have additional questions, please contact the PMG Project Coordinator, Dolly Feldman (dpfeldman@embarqmail.com, 434-996-3336), or the PMG Program Assistant, Melanie Feldman (fmelanie@vt.edu, 434-872-4582).

As you can see, the options available to anyone seeking to become involved in the scientific enterprise as a citizen scientist are many and varied—perhaps, even a bit overwhelming. However, there can be great satisfaction achieved in participation in such endeavors. Choose well and enjoy!

SOURCES

CitizenScience.gov

SciStarter

Citizen Scientist Detection Program for Spotted Lanternfly in Virginia

St. John’s Wort – Learn How to Choose

By Susan Martin | July 2021-Vol.7, No.7

When looking for a low-growing native plant for the forefront of our perennial sun garden, I became interested in St. John’s wort. Many of the sun-loving natives in our garden are tall and tend to become leggy as the growing season progresses. **St. John’s wort seemed to be a possible native filler plant** that could hide the leafless bottom portion of tall plant stems.

When I asked gardeners about the pros and cons of St. John’s wort, they gave mixed reviews. Some said that the nonnative species are invasive; some said even the native species are invasive. There even seemed to be confusion about which species are native. After beginning my research, I realized that one reason for the confusion is that there are **almost 500 different species of *Hypericum*, many of which are commonly referred to as St. John’s wort.** Plants of the genus *Hypericum* were apparently gathered and burned to ward off evil spirits on the eve of St. John’s Day, thus giving rise to the genus common name of St. John’s wort. To avoid the confusion of overlapping common names for different species, **it is advisable to use the Latin name when identifying *Hypericum* for purchase.**

Daunted by the prospect of almost 500 different species including perennials, trees, and shrubs, I decided to consult two main sources to identify the *Hypericum* species native to our area: the **Piedmont Virginia Native Plant Database** and the **Native Plant Finder By Zip Code.**

The Piedmont Virginia Native Plant Database lists one *hypericum* native to our area**: bushy St. John’s wort**

or dense St. John's wort (*Hypericum densiflorum*).

The Native Plant Finder By Zip Code cites 5 species of *Hypericum* that are native to zip code 22901:

- **shrubby St. John's wort** (*Hypericum prolificum*)
- **spotted St. John's wort** (*Hypericum punctatum*)
- **St. Andrew's cross** (*Hypericum hypericoides*)
- **St. Peter's wort** (*Hypericum crux-andreae*)
- **orangegrass or pineweed** (*Hypericum gentianoides*)

In addition to these **six native species**, I will also cover **two additional nonnative species that are commonly found in nurseries in our area: *Hypericum perforatum* and *Hypericum calycinum*.**

NONNATIVE *HYPERICUM* SPECIES

Hypericum perforatum

Common St. John's wort or perforate St. John's wort (*Hypericum perforatum*) is native to Europe, North Africa, and Southwest Asia. It is also commonly called **goatweed or Klamath weed.**

Hypericum performatum Photo: Creative Commons Zero, Public Domain

Plants were first brought to North America by settlers in 1696 and have naturalized over time throughout much of the continent. *H. perforatum* is classified as a **noxious weed** in over 20 countries. In the U.S., it is classified as an invasive or noxious weed in several states including Oregon, California, Washington, Montana, Nevada, Utah, Wyoming, West Virginia, and Indiana. It is also listed on Alaska's list of exotic plants.

The species grows 1-3' tall. It has small, paired, ovate leaves. **Most leaves have scattered, tiny translucent dots**; when held up to the light, they give the impression that the leaf is perforated (where the scientific name comes from). Yellow, star-shaped, ¾" flowers are 5-petaled with many stamens and have tiny black dots around the

edges. (See dots in the photo above.) Flowers bloom in June-August. The foliage has an unpleasant aroma when bruised or rubbed. Although tolerant of most soil types, the plant **prefers moist, well-drained soil. The species can grow in either full sun or in partial shade, but it flowers more profusely in full sun. It spreads by rhizomes** and, once established, it can be **highly invasive and very difficult to remove.** Its seed can be dispersed by wind, water, humans, and other animals. Seed can lie dormant in the soil seed bank for many years and germinate once the soil is disturbed. As an invasive, common St. John's wort can replace native plants in natural ecosystems.

The compound, **hypericin**, is found in stems, leaves, flowers, and seeds, and causes blistering and itching on light-haired or unpigmented skin exposed to intense sunlight. When an animal eats *H. perforatum,* hypericin reaches the skin from an internal route (stomach to blood to skin). It then **sensitizes white or unpigmented skin to sunlight and causes lesions.** I**n large doses, it is poisonous to livestock, especially horses and cattle.**

Hypericums have historically been used as herbal medicines, but *H. perforatum* is the one most commonly used today. Although **toxic,** *H. perforatum* has been used to treat people for depression, nervousness, and insomnia. It has been used externally to treat minor wounds, inflammations, burns, skin disorders, and nerve pain. It is banned in France and is available only by prescription in many other countries. According to the NIH National Center for Complementary and Integrative Health: "**It has been clearly shown that St. John's wort can interact in dangerous, sometimes life-threatening ways with a variety of medicines.** (**See this NIH link for more information on toxicity and safety warnings.**) It is sold in the U.S. as a dietary supplement; such supplements have lower standards for approval than over-the-counter medicines.

Hypericum calycinum

Commonly called **Aaron's Beard or creeping St. John's wort,** *Hypericum calycinum* is native to Southern Europe and southwestern Asia. This **stoloniferous subshrub** or shrublet typically **grows to 12″ (less frequently to 18″) high and 24″ wide** and is frequently **planted as a ground cover.** Large, 5-petaled yellow flowers are about 3" with numerous, erect stamens that give a powder-puff appearance in summer. Although *H. calycinum* tolerates a wide range of soils, **it thrives in sandy soils in full sun;** it is less floriferous in part shade. In full sun, the 4" long leaves are a rich green; in shade, they are a lighter, yellowish green; in fall, the leaves turn purplish. This species **spreads rapidly by underground stems** and can spread aggressively in ideal growing conditions, such as in **Oregon, where it is listed as an invasive.** It is not listed as an invasive plant by the United States Department of Agriculture, and **it is not toxic. Once established, it can be difficult to remove. In addition to spreading by rhizomes, its tap root and vertical roots can extend 5' deep.** Wilt and root rot can be significant problems, particularly in hot and humid climates of the South.

Hypericum calycinum Photo: Ανώνυμος Βικιπαιδιστής, Wikimedia Commons (CC SA-BY 3.0)

When massed on slopes, hillsides, or embankments, *H. calycinum* is effective for stabilizing soil. It is also used in rock gardens, border fronts, naturalized plantings, and as an edger for open woodland gardens. If considering this plant, **be aware of its potential spreading characteristics. You might consider using native *hypericum* species as an alternative.** (See the Missouri Botanical Gardens blog comments from home gardeners for observations on the spreading characteristics of *H. calycinum*. Of course, the reliability of these comments depends on whether the home gardeners are correctly identifying the species.)

HYPERICUM SPECIES NATIVE TO OUR AREA

Hypericum densiflorum

Hypericum densiflorum, Photo: Edward Schilling, Wikimedia Commons (CC BY-SA 4.0)

Bushy St. John's wort (*Hypericum densiflorum*) is a native shrub that can **grow up to 6' tall** with a spread of **3-6' wide.** It is native to eastern U.S. and west to Texas and occurs on **acidic soils in moist and wet conditions,** including streams, ponds, lake banks, seepage slopes, and wet meadows. It is adaptable to a variety of moisture levels and, once established, has some drought resistance. It tolerates a variety of soil types, including clay, loam, sand, and shallow rocky soil. Beautiful, finely-textured foliage turns yellow/gold in fall. **Clusters of 5-petaled, yellow flowers with multiple stamens appear in dense, flat-topped cymes from June-September.** Flowers give way to interesting cone-shaped pods which split in the fall and persist all winter. The glossy, coppery-colored bark of mature shrubs adds visual interest to the winter landscape. This shrub is easily grown in average, well-drained, moist garden soil in full sun to partial shade. Plant in groups, shrub borders, foundations, or as a hedge. It works well in a native/pollinator garden, a rock garden, or on slopes for erosion control. It is generally free of pests and diseases.

According to the Invasive Plant Atlas of the United States, this species does not appear on any state or national invasive species lists. **According to the Chesapeake Bay Foundation, it can spread aggressively,** so be sure to allow room if you choose this species.

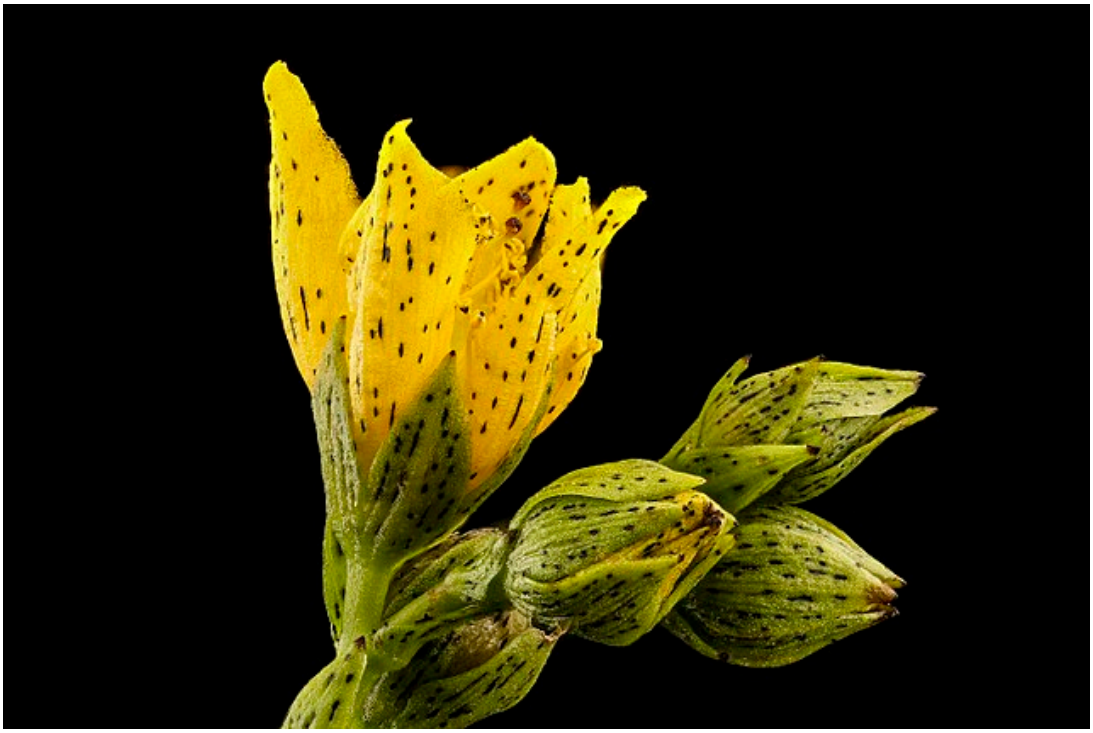
Hypericum prolificum

Shrubby St. John's wort (*Hypericum prolificum*) is a small, mound-shaped, deciduous shrub growing **2-4' tall**, with dense, upright branching. The lower stems are woody with shredded gray-brown bark, while the upper stems are green. **The root system is woody and branching.** Dark green, lance-shaped leaves are 2-3″ long and turn yellow-green in fall. Bright yellow, 5-petaled flowers (to 1″ diameter) have numerous, yellow stamens. Stamens are bushy to the point of partially obscuring the petals (hence the species name of *prolificum* which refers to the stamens). Flowers appear from June-August. Each flower is replaced by a cone-shaped seed capsule about 1/3–1/2″ in length, which splits in autumn to release black seeds. **The flowers are cross-pollinated primarily by bumblebees**, which collect pollen for their larvae. Sometimes butterflies and wasps land on the flowers in search of nectar, but the flowers offer only pollen. Caterpillars of the butterfly *Strymon melinus* (gray hairstreak) feed on the seed capsules, and caterpillars of *Nedra ramosula* (gray half-spot), and other moths, feed on the leaves. This native plant occurs on rocky ground, dry wooded slopes, uncultivated fields, gravel bars along streams, and in low, moist valleys. **It tolerates a wide range of soils, including dry rocky or sandy soils, and it can grow in full sun to part shade. It also tolerates some drought.** Although it has no serious disease or insect problems, root rot and wilt can be significant problems in hot and humid climates. Mass or group this species in the shrub border, include it in a native plant garden, or grow it as a hedge. It is also useful for stabilizing embankments. According to the list compiled by Rutgers on "Landscape Plants Rated on Deer Resistance," *H. prolificum* earns a B, which is "seldom severely damaged."

Hypericum prolificum Photo: Susan Martin, Ivy Creek Natural Area, Charlottesville, VA

According to the Invasive Plant Atlas of the United States, this species does not appear on any state or national invasive species lists.

Hypericum punctatum



Hypericum punctatum Photo: US Geological Survey (USGS) Bee Inventory and Monitoring Lab (Public domain)

Spotted St. John's wort (*Hypericum punctatum*) is a **perennial herb that grows up to 2 ½' tall**, branching occasionally in the upper half. Hairless, erect stems are multiple from the base and mostly unbranched, except in the flower cluster. Hairless, opposite leaves are up to 2½" long and 1″ across. They are oblong, oval, or bluntly lanceolate (with rounded tips). **New leaves are heavily dotted with black glands around the edges and on the underside. (**The invasive species, *H. perforatum,* has translucent dots on the leaves.) Tight clusters of yellow flowers bloom during midsummer, and the bloom period lasts for about a month. Each flower is a little less than ½" across and has 5 petals. In the center, a flask-shaped pistil is surrounded by numerous yellow anthers on long styles. The easiest way to distinguish spotted St. John's wort from other similar species involves an examination of the flower petals. For spotted St. John's wort, **dark dots and streaks can appear**

anywhere on the upper surface of the yellow petals, whereas for other species of St. John's wort, such dots and streaks are confined near the margins of the petals, or they are completely absent. There is no floral scent. The plant can **grow in full or partial sun; moist to mesic (moderate or well-balanced supply of moisture) conditions; and a rather lean soil,** which reduces competition from taller plants. **Rocky or gravelly soil is quite acceptable.** Occasionally, the leaves turn brown in response to drought; otherwise, this plant has few problems.

***H. punctatum* is pollinated by insects and has special value to bumblebees and sweat bees.** It also attracts beetles and hoverflies although these insects pollinate to a lesser extent. Its flowers do not produce nectar; insects are attracted by the pollen. **Gray hairstreak caterpillars** feed on the seed capsules and **gray half-spot caterpillars** feed on the leaves. Though insects eat the plant, **foraging mammals seldom feed on the foliage which contains hypericin.**

Numerous tiny seeds are scattered by the wind when the stems sway back and forth. **The root system consists of a branching taproot and short rhizomes. Although vegetative colonies of this plant can develop from the rhizomes, I did not find any warnings on invasiveness.**

According to the Invasive Plant Atlas of the United States, this species does not appear on any state or national invasive species lists.

Hypericum crux-andreae

St. Peter's wort (*Hypericum crux-andreae*) is a small, upright **shrub that grows 1-3' tall** with **4-petaled flowers,** instead of the usual 5 petals generally characteristic of other St. John's worts. (This Latin name is correct, even though it seems to go with St. Andrew's cross.) The sepals are of very unequal sizes. **Brilliant lemon-yellow flowers** form at its branch tips, and bloom from June-October. The slender shrub has opposite, pale green, oval-to-oblong leaves about 3/4'' wide, and shedding bark on older wood. In its native habitat, this shrub is usually found in **moist sandy woods, pinelands, stream banks, wet prairies, and pond margins**. It can also appear in disturbed fallow fields. Seed dispersal is thought to be by gravity. **It prefers partial sun and is adaptable to different soils.** It ranges from New York south to Florida and west to Texas; in the north, it may form a mat on the ground. St. Peter's wort is critically imperiled in Florida, according to the Institute for Regional Conservation. According to the U.S. Department of Agriculture, it has disappeared from Pennsylvania, and Kentucky lists it as threatened. *H. crux-andreae* has been observed to host skippers such as *Panoquina ocola* (family Hesperiidae).

Hypericum crux-andreae Photo: Eric Hunt, Wikimedia Commons (CC BY-SA 4.0)

I didn't find any mention of invasiveness, nor was this species included on invasive lists.

Hypericum hypericoides

St. Andrew's cross (*Hypericum hypericoides*) is a **small shrub growing 1-3' tall.** The common name refers to St. Andrew, the patron saint of Scotland, who is said to have been martyred by crucifixion on an x-shaped cross. The **flowers are small (<1") and creamy yellow with four narrow petals** arranged in an "X." (The 4 petals are narrower than those of St. Peter's wort.) The flowers have many prominent yellow stamens and 4 unequal sepals. It blooms from July-October, although in some zones its bloom period is given as May-August. Leaves are opposite and may be linear, elliptical, or ovate, and up to 1/3" wide, which is narrower than the leaves of St. Peter's wort. Stems are branched and reddish-brown. Fruits are reddish-brown ovoid capsules. **Propagation is by seed and dispersal is generally thought to be by gravity**; some seeds were discovered in a 112-year-old field site. **Preferred sites are wet to moderately dry, well-drained, or calcareous soils in partial sun.** It ranges from New York to Florida and west to Texas. It is sometimes found in the same habitat as St. Peter's wort. This species is known to be **eaten by white-tailed deer, mostly during the winter.** On the state level, *H. hypericoides* is considered vulnerable in the state of Delaware.

Hypericum hypericoides Photo: Eric Hunt, Wikimedia Commons (CC BY-SA 4.0)

According to the Invasive Plant Atlas of the United States, this species **does not appear on any state or national invasive species lists.**

Low St. Andrew's Cross (*H. suffruticosum*) is only 2 ½ – 6" tall, with usually only 2 sepals, the flowers eventually nodding; it is found in sandy sites in the coastal plain from South Carolina south to Florida and west to Louisiana.

Hypericum suffruticosum Photo: Homer Edward Price, (CC BY-SA 2.0)

Hypericum gentianoides

Orangegrass or pineweed (*Hypericum gentianoides*) is the only **annual** St. John's wort from our list. With tiny yellow flowers that open only in the sun, and scaly leaves on erect, wiry branches, its appearance is also unlike other St. John's worts. Generally, *H. gentianoides* flowers from July-October; however, it has been observed flowering in May through July and September. Its seed capsules are usually red. It proliferates in fields, rock outcrops, woodland borders, eroding areas, pond margins, and flatwoods. Although it most often occurs in non-wetland habitats, it can also occasionally be found in wetland habitats. **It mostly grows in open areas with sandy or rocky soils; it can also tolerate partial shade.** It is distributed from Maine and Ontario west to Minnesota, and south to southern Florida and Texas. It propagates by seed which is

believed to be dispersed by gravity. When crushed, its leaves give off a citrus smell.

H. gentianoides is listed as endangered by the Iowa Department of Natural Resources Parks, Recreation, and Preserves Division. It is also considered vulnerable in Michigan, imperiled in Vermont, critically imperiled in Oklahoma and Ontario, and is an **exotic species (not native) in the Canadian provinces of New Brunswick, Nova Scotia, and Prince Edward Island.**

It is not included on invasive lists for the U.S. However, its listing as an exotic species in the three Canadian provinces mentioned above plus Ontario, indicates that it may have worrisome invasive characteristics.

Hypericum gentianoides Photo: Fritzflohrreynolds, Wikimedia Commons (CC BY-SA 4.0)

HYPERICUM IN THE FOOD WEB

According to the Native Plant Finder by Zip Code, *Hypericum* species that are native to zip code 22901 are the **larval host plants for 23 species of butterflies and moths.** *Hypericum* species are attractive to many native bees including: polyester, yellow-face, large carpenter, bumble, leafcutter, resin, and sweat bees, as well as to gray hairstreak butterflies, whose caterpillars feed on the seed capsules, and to gray half-spot moths, whose caterpillars feed on the leaves. Hoverflies and skippers are also attracted to some species. Shrubby **St**. **Johns wort** produces seeds that persist all winter, making it a favorite of finches and sparrows.

SUMMARY

The *Hypericum* genus is a fascinating collection of plants comprising almost 500 species. The research for this article was done with the perspective of identifying native species that might be used in home landscapes. I was particularly interested in identifying species that would be good "filler" plants in the lower layer of perennial gardens. After my research, **the two non-native *Hypericums* are <u>not attractive as possible additions to the landscape:</u> *H. perforatum* is very invasive, and *H. calycinum* may be invasive,** especially in conditions that are attractive to the plant. **Unfortunately, these are the *Hypericum* species that seem easiest to purchase.**

Of the native species, there are a few candidates for home landscaping that could be very attractive, depending on your landscape's moisture and sunlight conditions, and available space. **Most species are described as being adaptable. *H. densiflorum* is attractive as a larger-sized shrub**, if there is **enough space for it to spread.** It has attractive foliage, good fall color, a long bloom period, and attractive seed pods and interesting bark for winter interest. It does well in moist and wet conditions. ***H. prolificum* is a small shrub that does not appear to have spreading characteristics.** It has a long bloom period, and performs well in a range of soil, moisture, and light conditions. (This species sounds promising although it can grow to 4' tall.) ***H. punctatum* seems like a possible candidate for the filler layer**. It's a **perennial herb that grows to 2 ½'** and has a long bloom period. It's adaptable to a range of conditions except for drought. It is attractive to bees. **It does contain hypericin** which may be a problem for dogs or cats who eat plants. The hypericin content means it will be deer resistant. ***H. crux-andreae* is a small shrub** that

likes **moist conditions in partial sun. *H. hypericoides* is a small shrub that likes semi-shady, wet- to moderately-dry areas. Neither of these shrubs are invasive.** Unfortunately, *H. hypericoides* is susceptible to deer browse. The **annual species, *H. gentianoides,*** is mainly found in **dry areas with sun**. It is listed as an exotic species (nonnative) in several eastern Canadian provinces which means it must have some invasive characteristics in those areas. **The availability of these lesser-known species might be a challenge. Working with local native plant nurseries would be the most promising approach.**

SOURCES

Piedmont Virginia Native Plant Database, http://webapps.albemarle.org/NativePlants/list.asp

Native Plant Finder by Zip Code, https://www.nwf.org/NativePlantFinder/Plants/1707

"*Hypericum perforatum,* Common St. John's Wort," *Minnesota Wildflowers,* https://www.minnesotawildflowers.info/flower/common-st.-johnswort

"*Hypericum perforatum*," Royal Horticultural Society, https://www.rhs.org.uk/plants/9021/hypericum-perforatum/details

"St. Johnswort: Identification, Biology, and Integrated Management," Montana State University Extension, https://apps.msuextension.org/montguide/guide.html?sku=MT199810AG

"St. John's Wort, *Hypericum perforatum,*" National Center for Complementary and Integrative Health (NIH), https://www.nccih.nih.gov/health/st-johns-wort

Common St. John's Wort, *Hypericum perforatum L.*, Invasive.org., https://www.invasive.org/browse/subinfo.cfm?sub=4411&start=1

'*Hypericum calycinum,* NC State Extension, *https://plants.ces.ncsu.edu/plants/hypericum-calycinum/*

"*Aaron's Beard, Hypericum calycinum L., Invasive Plant Atlas, https://www.invasiveplantatlas.org/subject.html?sub=18314*

"*Hypericum calycinum," Missouri Botanical Garden,* http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?kempercode=a520

"*Hypericum densiflorum*, Bushy St. John's Wort," NC State Extension, https://plants.ces.ncsu.edu/plants/hypericum-densiflorum/

"*Hypericum densiflorum*, Bushy St. John's Wort," Mt. Cuba Center, https://mtcubacenter.org/plants/bushy-st-johns-wort/

"*Hypericum densiflorum*," Chesapeake Bay Native Plant Center, http://www.nativeplantcenter.net/plants/hypericum-densiflorum/

"Spotted St. John's Wort, *Hypericum punctatum*," Illinois Wildflowers, https://www.illinoiswildflowers.info/prairie/plantx/sp_stjohnwortx.htm

Spotted St., John's Wort*, Hypericum punctatum*, Minnesota Wildflowers, https://www.minnesotawildflowers.info/flower/spotted-st.-johns-wort

"Shrubby St. John's Wort – *Hypericum prolificum*," Illinois Wildflowers,

https://www.illinoiswildflowers.info/prairie/plantx/sh_stjohn.htm

"Flower Friday: St. Andrew's Cross, *Hypericum hypericoides*," Florida Wildflower Foundation, https://flawildflowers.org/flower-friday-hypericum-hypericoides/

"*Hypericum hypericoides,*" Ladybird Johnson Wildflower Center, https://www.wildflower.org/plants/result.php?id_plant=HYHY

"*Hypericum crux-andreae*, St. Peter's Wort," Lady Bird Johnson Wildflower Center, https://www.wildflower.org/plants/result.php?id_plant=HYCR3

"St. Peter's Wort, Atlantic St. Peter's Wort," Texas Native Plants Database, Aggie Horticulture, https://aggie-horticulture.tamu.edu/ornamentals/nativeshrubs/hypericumcrux.htm

"St. John's Wort, or St. Peter's Wort, or St. Andrew's Cross?" NC Cooperative Extension, https://lee.ces.ncsu.edu/2018/11/st-johns-wort-or-st-peters-wort-or-st-andrews-cross/

"*Hypericum gentianoides,*" Lady Bird Johnson Wildflower Center, https://www.wildflower.org/plants/result.php?id_plant=HYGE

"Pineweed (orange grass), *Hypericum gentianoides*, Connecticut Botanical Society, https://www.ct-botanical-society.org/Plants/view/283

"*Hypericum gentianoides,*" University of Michigan LSA Herbarium, https://michiganflora.net/species.aspx?id=1461

Indiana Invasive Species Council, https://www.invasive.org/species/list.cfm?id=167

California Invasive Plant Council, https://www.invasive.org/species/list.cfm?id=64

Montana Noxious Weeds, https://www.invasive.org/species/list.cfm?id=38

Oregon Noxious Weeds, https://www.invasive.org/species/list.cfm?id=56

Nevada Noxious Weeds, https://www.invasive.org/species/list.cfm?id=29

Alaska Exotic Plant Information Clearing List, https://www.invasive.org/species/list.cfm?id=86

Utah Noxious Weeds, https://www.invasive.org/species/list.cfm?id=33

Washington Noxious Weeds, https://www.invasive.org/species/list.cfm?id=61

West Virginia Invasive Species Strategic Plan and Volunteer Guidelines 2014, https://www.invasive.org/species/list.cfm?id=184

Wyoming Noxious Weeds, https://www.invasive.org/species/list.cfm?id=40

"St. John's Wort, Friend or Foe?" myMotherLode.com, https://www.mymotherlode.com/news/local/310245/st-johns-wort-friend-or-foe.html

"A Review of Some Biological Control Programs for Invasive Plants," Ontario Invasive Plant Council (pp.21-28), https://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/06/Bill-MacIlveen-1.pdf

Feature Photo: shrubby St. John’s wort (*Hypericum prolificum*) Photo: Susan Martin, Ivy Creek Natural Area, Charlottesville, VA

Upcoming Events July 2021

By Susan Martin | July 2021-Vol.7, No.7

IVY CREEK NATURAL AREA AND THE JEFFERSON CHAPTER, VIRGINIA NATIVE PLANT SOCIETY WILDFLOWER WALK
IVY CREEK NATURAL AREA
1780 Earlysville Rd.
Charlottesville, VA 22903Saturday, July 10
9:00-11:30 AM

Ruth Douglas will lead this wildflower walk, with a focus on the Peninsula Trail. Wildflowers that are usually in bloom there in mid-summer include: false foxglove, St. John's wort, swamp rose-mallow (a spectacular shrub in the *Hibiscus* genus), and pickerelweed (listed as rare in the Inner Piedmont where we are). If there is time, on the way back from the Peninsula Trail we will stop briefly at the Martin's Branch delta off the red trail to view plants that grow in that moist area. All participants who are not vaccinated are asked to wear a mask. In addition, the walk will be limited to 20 people, and reservations are required. Because of paving work, meet at the west end of the parking lot in the island area.

To reserve a spot, send an email to Jeffersonvnpsfieldtrips@gmail.com with your name and email address.

HEARTFLAME GARDEN
OPEN TO VISITORS
650 Sandy Bottom Rd.
Near Elkton, Virginia 22827 (Adjacent to **Shenandoah National Park)**
Phone: (540) 298–8684
email: inanna@heartflamegarden.com

This three-season, breathtakingly beautiful garden stretches over 2 acres, and is open to the public free of charge. The garden owners, Inanna and Gabriel Garretson, ask that you call or email before visiting unless you plan on attending one of the **OPEN** days where everyone is invited without appointment. The next open days are 10/10 and 10/17. Please see this **LINK** for more information and to see recent photos of what's in bloom. This garden is amazing!

VIRGINIA NATIVE PLANT SOCIETY
STATE AND CHAPTER EVENTS

See this LINK for a listing of both virtual and in-person June events hosted by different state and chapters of the VNPS.

BLUE RIDGE PRISM (PARTNERSHIP FOR INVASIVE REGIONAL SPECIES MANAGEMENT)
INVASIVE PLANT WORKSHOPS: IDENTIFICATION AND CONTROL
WORKSHOPS VIA ZOOM

See this LINK for general information on PRISM, research updates, invasive plant factsheets, and more.

Free Quarterly Event on Zoom
July 21 – Invasive Warm Season Grasses – REGISTER
October 21 – to be announced

CHARLOTTESVILLE AREA TREE STEWARDS
FREE CLASS VIA ZOOM

"Restoring the American Chestnut"
Tuesday, July 20
7:00-8:30 PM – REGISTER

The virtual class is free**,** but registration is required. After you register, you will receive an email with a **Zoom** link a few days before the class.

INTERESTED IN BECOMING A TREE STEWARD VOLUNTEER? REGISTRATION NOW OPEN FOR THE FALL SESSION

See this LINK for more information and to register. **COVID permitting, training to become a Tree Steward will proceed with a combination of online and live classes beginning August 3rd and ending November 13th**.

NDAL – NEW DIRECTIONS IN THE AMERICAN LANDSCAPE
HOME GARDENER VIRTUAL SERIES
"BROADENING OUR LANDSCAPE VISION: ECOLOGY, CULTURE, AND ART"

"Organic Landscaping: A Different Way of Thinking"
Monday, July 19
1:00 – 2:30 PM
For more information and to REGISTER.

Organic landscaping entails more than switching from conventional to organic products. It compels a new mindset that recognizes fundamental change in the ways we think about landscape, and is long overdue. We will explore the deeper origins of "organic thinking" and how it has enabled the 21st Century landscape to be born.

"Native Meadows: Let's Get Real"
Thursday, August 12
1:00 –2:30 PM

For more information and to REGISTER

Wildflower meadows were introduced to the American gardening public in the 1960's along with tie dye tee shirts and kaleidoscopic acid trips. But just like those 60's acid trips, the colors never lasted. Alternatively, by planting site-adapted native perennials, managed according to the ecological processes that govern open field vegetation in the wild, long-lived vibrant meadows can be consistently achieved. In this presentation plant selection criteria, planting procedures, and management techniques will be illustrated through a series of residential case studies, including some over two decades old.

THE NATURE FOUNDATION AT WINTERGREEN
3421 Wintergreen Drive, Roseland, VA 22967

July Guided Hikes

For information on guided hikes, difficulty ratings, and to register, please see this LINK to the July/August calendar.

NATIVE PLANTS FOR SALE AT THE NATURE FOUNDATION AT WINTERGREEN GREENHOUSE
725 Beech Grove Road, Roseland, VA 22967
Phone: 434-325-8169
Email: info@twnf.org

The Greenhouse is closed Sunday and Monday; hours vary from Tuesday-Saturday. See this LINK for more information and to see a **listing of native plants available for purchase.** Plants can also be ordered online and picked up at an arranged time by emailing info@twnf.org

MT. CUBA CENTER
VIRTUAL CLASSES, JUNE-AUGUST

"Native Annuals: An Underutilized Resource"
Wednesday, July 14, 7:00 – 8:30 PM

"Instant Rain Garden"
Saturday, August 7, 10:30 – 12:00 PM

For more information and to REGISTER, see this LINK.

Mt. Cuba Center is a non-profit botanical garden located in Hockessin, Delaware near Wilmington. Its woodland gardens produce some of the most spectacular displays of wildflowers in the mid-Atlantic region. The botanical garden is now open to the public, see this **LINK** for info. **See this LINK for information on Mt. Cuba's world-famous trial garden and study results.**

BROOKSIDE GARDENS, MONTGOMERY PARKS, MD
FREE VIRTUAL CLASSES

"**A New Garden Ethic"**
Saturday, July 10
10:00 – 11:30 AM

In a time of mass extinction and climate change, how and for whom we garden matters more than ever. Our built landscapes reflect social ethics and values that guide our response to reviving wildness in and outside the urban environment. How can we recognize and develop compassion for other species? What role do native plants have in opening us to the perspective of others?

Registration required. See this LINK to learn more and to REGISTER.

MONARCH JOINT VENTURE
THE 2021 MONARCH CONSERVATION WEBINAR SERIES
4th Tuesday of the Month *
2:00 PM EST

The Monarch Joint Venture is partnering with the U.S. Fish and Wildlife Service National Conservation Training Center to put on another year full of informative and inspiring webinars on all things monarch. Webinars will be held live on the 4th Tuesday of the month at 2 PM EST. Each webinar will be recorded and for later viewing as well. Check on the session title to register.

Future Webinar Titles:

- **July 27th** – Aligning Mosquito Control with Pollinator Protection

- **August 24th** – Conserving Grasslands for Birds and Monarchs
- **September 28th** – Protecting and Restoring California's Overwintering Groves
- **October 26th** – Recovery of the Monarch Butterfly: Federal and State Legislation that can Provide Hope for this Iconic Animal
- **November 16th** – The Monarch Butterfly Fund – Supporting Monarch Conservation in Mexico
- **December 21st** – Eco-literacy and Conservation: The Convergence of Research, Policy and Education

* The November and December dates have been moved to avoid conflicting with major holidays. Please note this list is subject to change. Their EVENTS PAGE will have the most up to date information on the webinar series, as well as a calendar of additional monarch-related events, and information on recordings of past webinars.

VIRGINIA COOPERATIVE EXTENSION (VCE) VIDEO LIBRARY

VCE offers a variety of **YouTube videos** on topics geared to both beginner and more advanced gardeners. Examples of topics include:

Vegetable Grafting for Home Gardens
Plant Disease Clinic: IDs and Diagnoses
Weed Identification: IDs and Diagnoses
Basic Entomology and Insect ID Lab
Soil Testing Lab: IDs and Diagnoses

For these and many more videos that address specific topics or those of more general interest, see this **LINK**.

Two Terrific Tomato Sandwiches

By Erin Hall | July 2021-Vol.7, No.7

Tomato season is almost upon us. Those who grow them—or have a good farmers' market source—may look forward to the incomparable pleasure of vine-ripened, never-refrigerated, sliced heirloom tomatoes, and the many ways they may be enjoyed fresh. At our house, we have sandwiches for lunch. These two sandwiches are as good a reason as any to grow tomatoes.

The Tony Sandwich

This sandwich is named for the friend who invented it and shared the recipe with us early in our marriage. It hits all the right notes.

1. For bread, use a **Kaiser roll or two slices of sturdy country bread**.

2. Start building with a generous smear of softened **cream cheese** on the bottom. Add a couple slices of **Lebanon bologna**.
3. Top with a slice of **sweet onion.**
4. Add thick sliced and peeled ripe red **tomato.**
5. Sprinkle with **salt and pepper.**
6. Pave with fresh **basil leaves.**
7. Spread **mayonnaise** on the top slice.
8. Close and enjoy.

Notes: We peel tomatoes for this sandwich We peel tomatoes for this sandwich because my husband's family, who are French, prefer them peeled. You could use salami in place of the Lebanon bologna, but I highly recommend seeking out this bologna for its sweetness, which makes this sandwich special.

Smoked Turkey & Tomato

Though I don't recall where this one came from, I have been making it for years—always to good reviews.

Make **curried apricot mayonnaise** by combining **mayonnaise** and **apricot jam** with enough **curry powder** to lend a pronounced flavor. I don't measure, so simply use the amounts that suit you — for the number of sandwiches you're making. Let your tastebuds be your guide.

To assemble the sandwich,

1. For bread, use a **Kaiser or another soft roll**.
2. Spread both halves with **curried apricot mayonnaise.**
3. Add thinly-sliced **deli smoked turkey** on the bottom half.
4. Top with **sliced provolone.**
5. Add sliced ripe **tomato** from the garden.
6. Top with leaves of **watercress** or **arugula.**
7. Sprinkle with **chopped walnuts**
8. Close and enjoy.