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Another Pesticide Controversy: Neonicotinoids and Pollinator Decline

By Ralph Morini | May 2019-Vol.5 No.5


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A class of pesticides called neonicotinoids, neuro-active systemic insecticides chemically similar to nicotine, are currently under scrutiny for harming pollinators. There is the familiar argument between manufacturers who claim that no adverse effects on bee colonies have been observed "at field-realistic exposure conditions" and scientists and pollinator advocates saying the opposite. Let's sort things out.

First off, there's the pronunciation issue. Here is phonetic guidance on how to say "neonicotinoid". This mouthful is often shortened to "neonic" — pronounced "nee-oh-nick" for convenience. There are six compounds that make up the neonic population: acetamiprid, clothiandin, dinotefuran, imidacloprid, thiacloprid, and thiamethoxam. Manufacturers of the technical ingredient include BayerCropScience, Syngenta and Valent. Other companies formulate and sell products for commercial and home use. Examples of neonic brands are listed here.

Photo: Imidacloprid on label: risdmaharamfellows.com

How They are Used

Neonics are systemic pesticides that kill a variety of pests including sap suckers and leaf chewers like aphids and root feeding grubs. They are taken up by the plant and transported throughout its tissues, including leaves, flowers, roots, stems, pollen and nectar. They are commonly applied via a seed coating or soil drench to be taken up by roots, or when spray applied, to be absorbed through foliage. They may also be utilized as tree injections and as granules.

They attack the central nervous system of insects when ingested, preventing transmission of nerve stimuli, causing paralysis and death. The affected neural pathways are more sensitive in insects than mammals, making neonics more toxic to insects than mammals.

Neonics remain in plants for weeks after treatment, and they degrade slowly, lasting months or years in soil and leaching into groundwater under some conditions. Their presumed benefit when introduced in the 1990s was that they are effective in lower concentrations than older organophosphates and carbamates, and that seed treatments were felt to be more effective than spraying. Ironically, their systemic action, persistence in crops and soil, and potency in low concentrations make them useful against targeted pests but harmful to non-target organisms including pollinators.

Neonicotinoids are the most widely-used class of pesticides worldwide, used on 140 crop varieties, including cereals, cotton, legumes, potatoes, orchard fruits, rice, and vegetables. They are also used on turf, ornamentals, timber and in pet tick and flea collars.


Photo: hnnh.info

Pollinator Impact

Early studies of neonic effects on pollinators were criticized for not being representative of real world conditions. However several peer-reviewed studies published since 2017 were conducted in the field and appear to have confirmed the link between use of various neonics and damage to pollinator health. Interestingly, the preponderance of honey bee exposure in a Canadian study was determined to be from pollen in non-target plants, indicating possible dispersion of neonic substances as dust from seed during planting. Similar results have come from multiple studies of rapeseed in Europe. The effects include pollinator death following high exposures, and decreased overwintering survival, lowered immune response, and reduced reproduction from lower exposures. There is also an alleged increase in toxicity when some common fungicides and neonics are used in the same agricultural fields.

Neonic plant tag: Photo Jill Staake, birdsandblooms.com

While there is still some dispute from manufacturers, the data linking neonicotinoid use to pollinator decline is only strengthening. Certain neonics have been outlawed by the European Union since 2018. Here in the U.S., the EPA is evaluating its stance on these pesticides. Its final risk assessment and interim regulatory decision is expected to be issued in the near future. Although pollinator health is not likely harmed by occasional exposure to neonic-treated plants, numerous retailers, including Lowes and Home Depot, have committed to eliminating the sale of neonic-treated plants and to labeling those that are treated until the practice is eliminated. The world is moving in the right direction; it is a question of whether we are moving fast enough.

Alternatives to Neonicotinoid Use

As is the case with most toxic agricultural chemicals, there is no alternative that is as convenient to use and, at least in the short term, as deadly to pests as neonicotinoids. But, as we see the unplanned harm that they do and as the inevitable resistance of targeted pests increases, we come to understand that the long-term solution is managing pest damage, not futilely trying to eliminate pests.

Pyrethroids, synethetic pesticides with chemical structures similar to pyrethrins, were thought to be a potential neonic replacement. Pyrethrum is a naturally-occurring mixture of chemicals found in certain chrysanthemum flowers, and it was first recognized as having insecticidal properties around 1800 in Asia. The manufactured pyrethroids, however, have higher levels of toxicity than the natural pyrethrins. Their toxicity to beneficial insects, pest predators and parasitoids, risk to aquatic insects, and risks of secondary pest outbreaks argues against the expanded use of pyrethroids.

In 2014, Bayer announced, and the EPA approved, registration of a new pesticide, Flupyradifurone, claimed to be safer for bees. However, testing to date is inconclusive. Testing has not been representative of real

world commercial agricultural conditions concerning non-targeted plants and potential synergistic effects with other commonly-used agricultural chemicals. Given its similar chemical structure to neonics, it seems like it was initially overhyped by the manufacturer.

The recommended approach to pest control is via an Integrated Pest Management (IPM) practice. The IPM concept is valid for both commercial agriculture and home gardeners. It is an eco-system based strategy with:

- a long term prevention focus utilizing:
    - cultural practices
    - biological controls
    - habitat manipulation
    - resistant plant varieties
- using pesticides only when necessary based on a documented monitoring approach
- removing only the target organism
- selecting actions to minimize hazards to humans, beneficial and non-target organisms, and to the environment

Because IPM practices are targeted at specific identified pests, an indiscriminate preemptive approach like treating seeds with a systemic pesticide isn't allowed. IPM is a process that follows these steps:

- Monitoring: inspection to determine specific pest type(s) and infestation levels
- Record keeping to establish trends/patterns, including dates, pest identification population, distribution, prevention plan, treatment plan
- Action levels: action plan for particular pests and population sizes
- Prevention plan: the primary means of pest control
- Tactics and criteria:
    - Cultural, biological, and structural tactics
    - Chemicals as a last resort, using the least-toxic first to minimize possible harm to humans, non-target organisms, and the environment
- Post action assessment: what worked, what didn't, how should we revise the plan for next time?

Home Gardener Approach

The major risk to pollinator populations derives from chemical-based commercial agriculture, where pesticide application is widespread in anticipation of infestations and often not successfully confined to target crops or target pests. At home, it makes sense to follow the IPM protocol, perhaps a little less formally, but in principle. The concept is to treat causes of pest infestation as infestations occur and to manage pest damage naturally and only on an as-needed basis, rather than chemically on a predetermined schedule.

Cultural practices may include:

- Regular compost additions to maintain a healthy population of soil organisms
- Crop rotation to avoid inadvertently helping pests thrive via monoculture
- Intercropping and companion planting to attract beneficials while reducing attraction of and potentially warding off pests
- Using physical barriers like fine mesh netting and row covers to prevent pests from reaching crop plants
- Hand removing larger pests from plants when practical

- Maintaining garden hygiene by removing diseased and end of season vegetation from the garden and disposing of it properly.

Photo: Ladybug larva preying on pests (by Ralph Morini)

Biological and habitat controls include:

- Importing predators and parasitoids that prey on the pests of concern. Note that specific pests demand specific predators and predators need a food source to stay in the garden area.
- Maintaining a chemical-free habitat that is welcoming to beneficials and pollinators

Using resistant plant varieties means researching and selecting the best available hybrids that are resistant to likely pest challenges.

When nothing else works and damage levels warrant continued action, research the organic and manufactured-chemical options for the specific pest in question. Insecticidal soaps are a good option for many sucking and chewing pests. Neem oil is similarly safe on food with no dangerous residues while killing or reducing pests, powdery mildew, and other fungal infestations.

If there is no good option but a neonic or other relatively toxic chemical, follow label directions carefully, use it minimally, and definitely avoid spraying open flowers and applying it during the day when pollinator activity is highest.

The Harder Path is the Right Path

As is so often the case, the more convenient approach, using neocotinoids and other chemicals on a widespread basis in anticipation of pest problems, is seductive but harmful longer term. Damage to pollinators, faster evolution of resistant pests and replacement of natural processes with chemicals are all costs that eventually have to be faced.

While commercial agriculture is where the large scale damage is done, home gardeners also have a role to play in changing practices and setting a tone for changing societal priorities. The IPM approach requires

more work and acceptance of a certain amount of pest damage but it is definitely more sustainable longer term. We have to reduce and manage the use of neonicotinoids and other agricultural chemicals or their long term impact will be far more harmful than beneficial.

Sources:

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"Schedule for Review of Neonicotinoid Pesticides," EPA, https://www.epa.gov/pollinator-protection/schedule-review-neonicotinoid-pesticides

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"Protecting Bees from Neonicotinoid Insecticides in Your Garden," Xerces Society, https://www.xerces.org/wp-content/uploads/2013/06/NeonicsInYourGarden.pdf

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Factsheet: Neem Oil, National Pesticide Information Center, http://npic.orst.edu/factsheets/neemgen.html

"Planning a Companion Vegetable Garden," https://www.gardeningknowhow.com/edible/vegetables/vgen/companion-vegetable-garden.htm

May In the Vegetable Garden

By Ralph Morini | May 2019-Vol.5 No.5

May is finally here and frost is (hopefully) not. The ground is warming and we can finally plant the summer vegetables we all love to grow and eat.

As noted in the last issue of *The Garden Shed*, Average Last Frost dates are a little ambiguous in the western Piedmont. Extension Publication 426-331, Vegetable Planting Guide and recommended Planting Dates, places Albemarle and surrounding counties in the Mountain region, rather than the Piedmont, and puts *average* last frost date as May 10-15. However, USDA places us in Hardiness Zone 7A with our *average* last frost date of April 15. Since "average" means 50% probability and since we are on the boundary, there is some guesswork involved. I and a lot of my friends use May 1 as our summer vegetable planting date and sneak a look at the long term forecast for confidence. In any case, it's wise to be ready to act if a late frost arrives unexpectedly.

So, depending on your risk preference and the National Weather Service crystal ball, get ready to plant your tomatoes, peppers, eggplant, squash, corn, beans, cucumbers and okra. Along with maintaining the early spring-planted crops such as potatoes, broccoli, cabbage, cauliflower, leeks and onions et al, May is about the busiest month of the year for the vegetable gardener.

If you are like most of us, you are always tempted to plant just a bit more than you have room for. Some helpful advice for garden planning is available in extension publication Planning the Vegetable Garden. When you figure out **what** to plant, refer again to Extension Publication 426-331, Vegetable Planting Guide for help deciding **when** to plant. As noted above, it is pretty conservative, and unless you are actually in the mountains, may be later than necessary to avoid frost. But in any case, understand the risks if you choose to plant earlier.

Extend your harvest season by planting sweet corn and beans every two weeks through the end of June.

Missing corn kernels on your corn ears? This may be the result of **poor pollination**. Sweet corn is wind-pollinated. **Block planting in short rows** (3-4 rows or more) **will pollinate more successfully** than 1 or 2 long rows. When doing succession planting, block the area into the sections. For example, if you have space for 4 rows of corn, rather than planting two long rows of corn and waiting 2 weeks to plant the remaining two rows, divide the area into two blocks and plant 4 short rows. Then two weeks later, plant the remaining 4 short rows. This procedure will insure greater pollination. For more information on growing sweet corn, take a look at Virginia Cooperative Extension Publication 426-405.

Hilling Potatoes: Photo: DIYNetwork.com

Keep your potatoes covered. The skins of potatoes exposed to sunlight will turn green. This green color comes from the pigment chlorophyll produced as a response to sunlight. “Green Potatoes” will often develop a bitter taste and may even become toxic. This can be prevented by covering the exposed potatoes — by hilling-up dirt over the potatoes, or covering them with straw mulch. For additional information on growing potatoes, see Virginia Cooperative Extension Publication 426-413

To control weeds in the garden, **destroy them before they develop seeds**. Refrain from cultivating and hoeing deeply; this can cause damage to the shallow roots of your vegetables. Also, avoid using mulch or compost contaminated with seeds. For additional information on controlling weeds in the home garden, see Virginia Cooperative Extension Publication 426-364.

For guidance on fertilizing, check out Extension Publication 426-323, Fertilizing the Vegetable Garden. In a few pages it offers a nice summary of plant nutrition requirements and fertilizing options.

When **watermelons, muskmelons, squash and cucumbers** are planted in a hill, **place a stick** upright in the middle of the hill and leave it there. Later in the summer when the hill becomes hidden by the vines, you will know where to water. You’ll not only be saving time looking for the main root, but you’ll be saving water as well.

Successful eggplant development is dependent on a span of temperatures of 80º-90ºF and plenty of water. Water well when plants are young. Water at least twice a week when temperatures are high and there is no rain. For additional information on growing eggplant in the home garden, see Virginia Cooperative Extension Publication 426-413 .

The best time to transplant tomato, pepper and eggplant is on a cool cloudy day or late in the afternoon to avoid the hot sun. This way the plants have time to acclimate to their new environment. If the following day is hot and sunny, a row cover may be used to reduce stress on the plant.

When transplanting seedlings in **peat pots**, gently tear off the top inch of the pot; the upper edges of the pot should be covered with soil to avoid wicking water away from the soil surface. Wicking may reduce the amount of moisture available to the roots of the plant.

Break the rule when setting-out tomato plants. The general rule for transplanting most plants is that the planting depth should be no deeper than the soil level they were originally grown in. This rule **does NOT** apply to tomato plants. The general rule for tomatoes is that **2/3 of the tomato plant should be below soil level.** First, gently remove the leaves on the bottom 2/3 of the plant before planting. Planting deep allows roots to sprout along the buried stem (adventitious roots). This results in a better and stronger root system and the end result is better tomatoes. In heavy soil or if you just don't want to dig deep, you can lay the plant on its side, provided that 5-6 inches of soil is placed over the roots and stem. For additional information on growing tomatoes, see VCE Publication 426-418 titled "Tomatoes" .

Resources:

"Vegetable Planting Guide and Recommended Planting Dates." Va. Coop. Ext. Publication No. 426-331, http://pubs.ext.vt.edu/426/426-331/426-331.html

"Vegetables Recommended For Virginia,"Va. Coop. Ext. Publication No. 426-480, https://pubs.ext.vt.edu/426/426-480/426-480.html

"Sweet Corn," Va. Coop. Ext. Publication No. 426-405, http://pubs.ext.vt.edu/426/426-405/426-405.html

"Potatoes, Peppers and Eggplant," Va. Coop. Ext. Publication No. 426-413, http://pubs.ext.vt.edu/426/426-413/426-413.html

"Weeds in the Home Garden," Va. Coop. Ext., Publication No. 426-364, http://pubs.ext.vt.edu/426/426-364/426-364.html

"Tomatoes," Va. Coop. Ext.Publication No. 426-418, https://pubs.ext.vt.edu/426/426-418/426-418.html

Gardening for Hummingbirds

By Cathy Caldwell | May 2019-Vol.5 No.5

Many gardeners would like to attract hummingbirds, but are eager to do more than hang hummingbird feeders. Indeed, those feeders can attract bears, too, so a natural route for feeding and attracting these beauties is looking more and more desirable! Knowing a bit about hummingbirds and their needs can help you to design a hummingbird-friendly habitat in your yard.

Let's start with a few hummingbird basics. There are no hummingbirds in Europe or Asia; all species of hummingbirds live in North America, Central America, or South America. Most species live near the equator, where there are nectar-rich flowers year-round. But some species migrate, heading to North America in spring and returning to their warmer digs in early fall. That's the case with the only species that nests in our area — the ruby-throated hummingbird.

Basic requirements: food, water, shelter, perches and nesting sites.

In order to create a hummingbird habitat, a gardener needs to provide for their basic needs: food, water, shelter from predators, perches, and nesting sites.

FOOD

These tiny energetic dynamos require lots of sustenance. A major source is **flower nectar,** and as a result, hummingbirds are pollinators. Their long beaks and tongues reach into tubular flowers for nectar, and they

pick up pollen on their beaks and feathers. Having almost no sense of smell, a hummingbird uses vision to find nectar-rich flowers. And being fast flyers, they depend on bright colors to alert them to a nectar source.

As most of us have observed, hummingbirds are particularly attracted to tubular-shaped flowers in shades of red and orange, though they will feed on flowers of other colors as well. This affinity is the result of coevolution or co-adaptation between the hummers and the plants in their habitats. Both flowers and hummingbirds benefit when a hummingbird sips a flower's nectar. Consequently, different species of hummingbirds have differently-shaped beaks that evolved to allow them to drink from a certain kind of flower. In return, the flower species it feeds from has evolved to produce nectar especially tasty to hummingbirds and to prevent insects from stealing it.

Ruby-throated hummingbird sipping from jewelweed in Brooklyn Botanic Garden. Photo: Steven Severinghaus

Three other flower characteristics that attract hummingbirds (and play a part in the coevolution of hummers and flowers) are nectar concentration, nectar volume, and the length of the flower tube (the corolla if you want to be scientific). Nectar consists mainly of sugar, water and salts. Hummers prefer flowers with a nectar concentration of 20-30% and with a plentiful nectar supply. The long flower tube helps to ensure that competition for nectar from other pollinators is limited.
https://extension.tennessee.edu/publications/Documents/W305.pdf

You may want to use artificial feeders as a supplement in late summer to early fall as hummingbirds

prepare for the long flight back to Central America. A simple recipe for artificial feeders is to add 1 part table sugar to 4 parts boiling tap water and boil for 2 minutes. Do not use honey (fermented honey can cause a fatal fungal disease), artificial sweeteners, or red food dye. Fill feeders with cooled mixture and change it about every 3 days. It is essential to hummingbird health to **clean the feeder** before adding a new supply. Some newer hummingbird feeders can be washed in the dishwasher. You can hand wash them with soapy water, but be thorough and scrub the small parts. Alternatively, you can use a weak bleach solution to sterilize the feeder. Remove the plastic flowers and scrub inside them with a small brush. Make sure to rinse all parts thoroughly before refilling with sugar solution. Keep in mind that feeders may attract bees, yellow jackets, wasps, hornets, ants, or other unwanted species.

Hummingbirds need more than nectar. In fact, **insects make up 50% of their diet** (75% during nesting season), so you want to encourage insects in your yard. That's right; *encourage* insects. Ruby-throats eat mosquitoes, spiders, gnats, fruit flies, small bees, larvae, aphids and insect eggs, and they look for them in flowers and on plant foliage or bark. In early spring, hummingbirds eat the insects that are attracted to sap from holes drilled in trees by yellow-bellied sapsuckers. You can encourage insects to live in your yard by avoiding the use of pesticides and by using plants that attract insects, including native grasses. Almost any type of plant will do. For example, purple coneflowers and bee balm both produce nectar that attracts many small insects suitable for hummingbird food.

WATER

Hummingbird mister. Photo courtesy of Wild Birds Unlimited.

Like most birds, hummingbirds like water, though bird baths are often too deep for them, so very shallow

bird baths are sometimes recommended. Just remember to keep them clean. On that subject, see "Creating a Bird-Friendly Garden," https://pmgarchives.com/article/creating-a-bird-friendly-garden/.

Even better than a bird bath, hummers love to play in **spraying or dripping water**. I made this joyous discovery last summer while watering a flower bed with a spray hose. Suddenly there were several hummingbirds frolicking in the mist, affording me an opportunity for close inspection of the birds. There are hummingbird misters on the market, so you may want to look into buying one. If you're handy, you might consider making your own. Here's a video of a homemade bath complete with splashing water, and even if you're not going to make it, you'll love watching the hummingbirds at play in it.
https://www.youtube.com/watch?v=-vsXFH0YbZE

NESTING SITES AND PERCHES

Ruby-throated hummingbirds often nest in or near forests and woodlands during spring. Their tiny nests are built from thistle, dandelion down, soft plant fibers, tree sap, and animal hair. Hummers use stretchy spider webs to hold these nesting materials together, often covering them with lichen for camouflage. The preferred location for a nest is often the fork of a downward-sloping tree branch with plenty of leaves above as protection from predators. Don't worry if you don't live near a forest; many urban dwellers have successful hummingbird habitats.

You can recreate these conditions by having a mix of tall trees, shorter trees, shrubs, along with lots of native plants that flower at different times. The mix of heights allows the hummingbird to choose a protected nesting spot as well as safe perches for resting. All that speedy flying is tiring, so a safe resting spot is essential. And these tiny birds do have predators, the major one being cats. Some people stick a tree branch in the ground, since perching at the top of a branch is a favorite with hummingbirds. Also, leave the outdoor spider webs alone and available for the nests.

Add as many of these elements as possible to your yard and you'll soon be hosting hummers. You can explore one gardener's hummingbird habitat via this PBS video:
https://www.pbs.org/video/the-wisconsin-gardener-an-urban-hummingbird-garden/. Even a patio or balcony can be hummingbird habitat; try adding plants for hummingbirds to a window box or container on your deck or patio, where you'll be able to watch their antics up close. Here's a video on that subject:
https://www.pbs.org/video/the-wisconsin-gardener-container-plants-that-attract-hummingbirds/

Plant Choices and Lists

Be sure to include nectar-rich flowers with differing bloom times, and aim to have at least one blooming throughout the hummingbird season. Plant these flowers in large groups so that they're easier for a flying hummingbird to spot; this also allows a hummer to use less energy in gathering nectar.

Some hummingbird afficionados plant nectar-rich flowers native to Central or South America — the hummers' winter habitat. For a list of warm-climate nectar-rich plants for hummingbirds, see the plants marked with an asterisk at http://www.hummingbirdsociety.org/hummingbird-flowers/. You'll find some of these on the list of annuals and tender perennials below.

Extensive lists of plants that attract hummingbirds are available in several of the publications listed in the

Sources section. The following list, which concentrates on native plants, will serve as a starting point.

Perennials

Plant	Bloom Time	Culture
coral honeysuckle (*Lonicera sempervirens)*	March-July	sun, partial shade, well-drained soil
fire pink (*Silene virginica*)	April-June	sun to partial shade, easy to grow in well-drained soil
wild columbine (*Aquilegia canadensis)*	March-May	sun, partial shade adaptable
wild bergamot (*Monarda fistulosa)*	June-September	sun, partial shade, adaptable
cardinal flower (*Lobelia cardinalis*)	July-October	sun, partial shade requires moist soil
gayfeather (*Liatris pilosa*)	August-November	sun, partial shade, poor to average soil

Annuals and Tender Perennials

pineapple sage (*Salvia elegans*)

Autumn or Texas sage (*Salvia greggii*)

snapdragons (*Antirrhinum* spp.)

scarlet sage (*Salvia coccinea*)

flowering tobacco (*Nicotiana* spp.)

jewelweed (*Impatiens capensis*) (Virginia native)

cigar flower or firecracker plant (*Cuphea ignea*)

For more information about *Salvia elegans* and *Salvia greggii,* see "In Celebration of Salvias, http://pmgarchives.com/article/in-celebration-of-salvias/

Trees (native trees with flowers that provide nectar for hummingbirds)

Ohio buckeye (*Aesculus glabra*)

tulip poplar (*Liriodendron tulipifera*)

Now for a closer look at some popular hummingbird attractors.

Coral honeysuckle
Photo courtesy of Missouri Botanical Garden PlantFinder

Coral Honeysuckle (*Lonicera sempervirens)*

Lonicera sempervirens, commonly called coral honeysuckle, may be the best plant for attracting and feeding hummingbirds. This native climbs by twining, so unlike *Campsis radicans*, it will work well on fences and will not lift siding off your house. The flowers are tubular, coral-red on the outside and yellow on the interior, and appear in late and mid-spring, and then occasionally thereafter. Coral honeysuckle is evergreen — which is the origin of its species name — especially in the South. wildflower.org/plants. Outside the South, it is usually semi-evergreen.

Coral honeysuckle. Photo courtesy of Mo.Botanical Garden PlantFinder

For a more detailed description of coral honeysuckle, see the excellent article accompanying its naming as Wildflower of the Year by the Virginia Native Plant Society, Wildflower of the Year 2014 Coral honeysuckle, (Lonicera sempervirens). As indicated there, nine species of *Lonicera* can be found growing wild in Virginia; only three of these, including the coral honeysuckle, are native. The other six are non-natives, including the extremely invasive Japanese honeysuckle (*L. japonica*). Coral honeysuckle can be distinguished from other honeysuckles in Virginia by the combination of climbing habit, glaucous (smooth, hairless) evergreen leaves, terminal flower clusters, and red tubular corollas with nearly equal-sized lobes (parts).

Trumpet Creeper (*Campsis radicans)*

Campsis radicans (commonly called trumpet creeper) is one of those natives that can be invasive, and whose only good characteristic is its ability to attract hummingbirds. This is a woody, deciduous vine that climbs by aerial rootlets, which reminds me of English ivy and the miserable time I had trying to extirpate it from my

yard. Thus, I can't recommend this plant, at least not the species, since it's asking for trouble. It spreads aggressively by underground suckers as well as seeds. Still, if you have a site with lean soil and space for spreading — perhaps a heavy-duty structure you'd like covered — it might be a reasonable choice. Some hummingbird enthusiasts do grow this plant, but in an out-of-the-way area. Alternatively, you could go with a cultivar, since they are apparently somewhat less difficult to control.

***Campsis radicans* Cultivars**:

Campsis radicans 'Flava' — a yellow-flowered trumpet vine growing to 20-40 feet

Campsis radicans 'Minnesota Red' — a dark red flowering trumpet vine growing to 30 feet

Campsis radicans 'Stromboli' –Dark red buds open to orange flowers. Grows to 20-30 feet.

Campsis x *tagliabuana* 'Mme Galen' — an apricot-flowered trumpet vine growing to 15-20 feet. *Campsis* × *tagliabuana* is a hybrid cross between *Campsis radicans* (American trumpet vine) and *Campsis grandiflora* (Chinese trumpet vine), and it flowers through most of the summer. This is the variety most often found in the retail nursery trade.

Campsis × *tagliabuana 'Madame Galen'. Photo courtesy of Missouri Botanical Garden PlantFinder.*

—Illinois Extension.edu/vines

A useful tip I came across is to plant trumpet creeper — if you must — in a location that will permit you to mow over the root area, a tactic which discourages the suckers. For an excellent comparison of this rampant grower with a somewhat tamer vine, see Crossvine: A Showstopping Native Vine, The Garden Shed, Apr. 2017.

Cuphea

Cuphea 'David Verity' Photo courtesy of the Missouri Botanical Garden PlantFinder.

Cuphea ignea, commonly called firecracker plant or cigar flower, is native to Mexico and the West Indies. It is a rounded, many-branched evergreen sub-shrub that grows 20-30" tall and wide. It has small, tubular,

bright red flowers that bloom from late spring to frost. Because it is not perennial in our area, you can grow it as an annual or in a container, bringing it inside for winter. It performs best in average, medium moisture, well-drained soils in full sun, though it tolerates part shade. It is easily grown from seed started indoors 10-12 weeks before last spring frost date. It tolerates high summer heat and some drought, but performs best with regular moisture. If it gets leggy, prune it back a bit. There are many species of C*uphea* and a number of varieties and cultivars.

The efforts you put into your hummingbird habitat will likely reward you for years to come. Many hummingbirds return to favorite spots year after year. Also, if you're interested in hummingbirds and helping scientists understand them and protect them better, you might want to get involved with the Audubon Society's Hummingbirds at Home, a citizen science project that collects observations about which plants they visit most often, among other things. http://www.hummingbirdsathome.org

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"Hummingbird Haven: Backyard Habitat for Wildlife," chesterfield.ext.vt.edu/pollinators/hummingbird-haven-and-attracting-butterflies.pdf

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Upcoming Events

By Susan Martin | May 2019-Vol.5 No.5

Virginia Native Plant Society Meeting: Tom Saielli on Status of American Chestnuts

Wednesday, May 8th, 7:30 p.m.
Education Building, Ivy Creek Natural Area, 1780 Earlysville Rd, Charlottesville

As the Regional Science Coordinator for the American Chestnut Foundation, Tom Saielli oversees the Foundation's research orchards and planting teams in Virginia, Maryland, West Virginia, and Kentucky from his office in Charlottesville. Tom will give an update on efforts to develop and return a blight-resistant, primarily native American Chestnut to forests in this region. All are welcome, as always.

Through The Garden Gate: Waterperry Farm

Saturday, May 11, 9:00 a.m. – 12:00 p.m.
Waterperry Farm, 4284 Ballard's Mill Rd.
Free Union, VA + Google Map

Take this opportunity to tour a local garden. Named after a pioneering English horticultural college for women, Waterperry Farm is an ongoing work of extensive landscaping. Once a gentleman's farm called Braeburn, with pasture pretty much in all directions, it was clear it needed more trees and a garden. Twenty-eight years and countless plantings later, the gardens contain enough species to qualify us (were we public) as a Level II Arboretum!

For more information, download a pdf of the 2019_TTGG_brochure. **Admission is $5**

Garden Basics: Roses Are Red, Yellow or Pink

Saturday, May 11, 2:00 – 4:00 p.m.
The Center, 491 Hillsdale Drive, Charlottesville
There is no charge for attendance, but **registration is required**. Send your name to:
info@pmgarchives.com

The Nature Foundation at Wintergreen Hike

Saturday, May 11
Saturday, May 25
Saturday, June 1
10:00 a.m. – 12:00 p.m.
3421 Wintergreen Dr., Roseland, VA
Phone: 434-325-8169; Email: info@twnf.org

Join a Foundation Naturalist for an interpretive hike. Explore Wintergreen's natural environment! These hikes are rated moderate. Nonmember fee is $8, no fee for members. Meet at the Nature Foundation. **Register** at: https://www.twnf.org/nature-events/

Blue Ridge PRISM
Partnership for Regional Invasive Species Management

Tuesday, May 14, 6:30 – 8:30 p.m.
Albemarle High School, Charlottesville
Class fee: $20. Register at https://www.blueridgeprism.org/

Using both classroom and outdoor instruction (weather permitting), this session will cover invasive plant identification and present the best spring-time and summer-time practices for each invasive. There will also be an opportunity to identify plants, so bring samples of your mystery plants!

The Wildflower Symposium

Friday, May 17, 3:00 p.m. – Sunday, May 19, 3:00 p.m.
The Nature Foundation at Wintergreen
Phone: 434-325-8169

The Nature Foundation at Wintergreen presents this wonderful celebration of the Blue Ridge in all its springtime glory. Workshops, wildflower walks and hikes, lectures, hands-on demonstrations, native plant sale, and more! Click here for more information – Wildflower Symposium brochure 2019.

Wine and Roses Open House at Tufton Farm

Saturday May 18, 10:00 a.m. – 2:00 p.m.
Thomas Jefferson Center for Historic Plants, 1293 Tufton Farm, Charlottesville

Savor the sights and scents of antique roses in peak bloom as you enjoy meeting with the "Father of Virginia Wine," Gabriele Rausse, as he hosts a tasting of his esteemed local wines from 12:00-2:00 p.m. Attend an outdoor lecture on how to care for antique and modern roses, and then tour the antique rose garden. A wide selection of historic plants, including antique roses, will be for sale. No fee to attend.

Virginia Native Plant Society
Native Plant Walk

Saturday, May 18th, 9:00 – 11:00 a.m.
Ivy Creek Natural Area, 1780 Earlysville Rd, Charlottesville

Join Mary Lee Epps to seek out late spring native wildflowers. What we find will depend on how warm the spring is, but we're likely to see Jack-in-the-pulpit, green-and-gold, the well-hidden blooms of heart-leaf ginger, and more. Meet by the kiosk near the parking lot. Free! All are welcome.

Container Gardening, Part I

By Cathy Caldwell | May 2019-Vol.5 No.5

When thinking about plants in containers, do you envision a windowsill filled with philodendron, grape ivy, and other houseplants, or a tub of petunias sitting on a sunny deck? These examples are only the beginning! Using your imagination, conjure an odd, little space around the house; an empty nook in a garden bed; a lonely stairstep; a small balcony or patio; or just the front door. You can start to dream about where a planter, urn, or basket might be just what you need. Whether you are a novice or a recognized “green-thumb,” container gardening offers a plethora of possibilities!

This container garden features a variety of ornamental flowers, small shrubs, and other plants in hanging baskets, mounted pots, and ground-level containers.

This article discusses the basic guidelines for growing plants in containers outside. Some ideas can be applied to houseplants; however, spring is the ideal time to plan for outdoor spaces. As with planning a special meal or a vacation trip, there are multiple strategies that can be followed. Getting ready can begin with choosing a container and acquiring other supplies, determining the location, and then selecting plants that fit the designated environment. Flowers, herbs, vegetables, and even trees and shrubs can thrive in containers when given care and attention.

Choosing a Container

A conventional pot, a barrel, or a creative “find” from the attic can make the perfect home for your plants. Drainage is a crucial feature. Excess water needs to soak through the soil and out to prevent problems such as root rot. If a container does not have adequate drainage, you may be able to drill or punch holes with a large nail. In addition, the container needs to accommodate root and plant growth and allow for aeration. Thinking ahead about the size and number of plants you choose to grow will contribute to good decisions regarding container dimensions. A small pot (six-inch round or less than one gallon) is a good choice for a single herb or small flower. A larger container (12″ to 18″ round or 5 gallons or more) can accommodate a collection of several plants or a shrub, such as a hibiscus, or a tomato plant.

Yellow pansies planted in an unconventional container – an old tire hung to an outdoor wall.

Selection of a container impacts both garden maintenance and appearance. A wide variety of materials are used for fabrication. These include pottery, clay/terracotta, concrete/cement, stone, peat pots, wood, molded plastic, fiberglass, metal, wire used for baskets, and recycled items, such as boots or carts. The design and construction of a container affects durability, resistance to temperature fluctuation, watering frequency, and mobility. Popular plastic containers are lightweight and available in an array of colors, sizes, and shapes. Double-wall design on plastic pots can help protect against extreme temperatures, while UV-treated polyethylene is color-fade resistant. Wooden planters are appealing for their natural look, portability, and do-it-yourself options. Choosing a lumber variety resistant to decay (such as cedar) and ensuring that the wood has not been treated with harmful preservative chemicals will help ensure product integrity and safety. Pottery, stoneware, and concrete can offer attractive and substantive planting possibilities. Depending on size and construction, the container may be heavy and difficult to move. Cracks in pottery are exacerbated by freezing and thawing, causing ultimate deterioration if left unprotected outside in the winter. If a decorative vessel does not have adequate drainage, address the problem with double potting: put the plant into a smaller second pot with drainage holes and place on top of some gravel inside a larger primary planter. Wire baskets and other creative receptacles may require a liner for planting. For example, enhance a hanging basket lined with a plastic bag by packing damp moss around the inside.

Smaller wooden planters are moved easily and provide a visual contrast to cement or concrete steps and foundations.

Grow bags, manufactured with thick, breathable fabric, are available in a variety of sizes and depths, depending on the intended use. They can be filled with soil and placed in a container with one large hole or many holes (like a laundry basket) or hung from a wall or railing. Advantages of grow bags are that they are particularly effective in providing plant roots with aeration and drainage. Also, the risk of soil-borne disease and fungus is significantly reduced by using a new or thoroughly cleaned bag for each planting.

Potatoes in grow bags. Photo: Mr.Mole

Garden suppliers offer an increasing repertoire of self-watering planters. Models vary, but generally water is drawn from a bottom reservoir into the soil by capillary action through small soil columns or rope wicks. Some planters have a mechanism to manage overflow. These planters are particularly useful for balcony gardening, where water supply and drainage may be challenging, and also for travelers or vacationers. Care should be taken to ensure that the soil is not too wet and plants do not show symptoms of overwatering.

With so many choices, selecting a container may seem overwhelming. As a guideline, keep in mind: convenience, cost, and curb-appeal! Consider the questions below and start simple, building on your successes and container collection.

Selecting a Container:
Questions to Think About

Is the material porous?
Will the pot be heavy and difficult to move?
Will it hang in the air?
Will the materials, size, or color result in fluctuating temperatures?
Will the material rot over time?'

Excerpted from:
University of Illinois Extension
https://extension.illinois.edu/containergardening/choosing_material.cfm

Preparing the Soil

Soil removed from the land may be too dense for healthy potted plants, and may also contain weeds that can crowd out chosen specimens.

To support plant growth, soil needs to be aerated, maintain a balance of nutrients, and retain moisture without getting soggy. As already emphasized, drainage is key to keeping plants healthy in a container environment. Commercial garden soil is too heavy and dense, thus depriving the plant of needed oxygen. Earth taken directly out of the garden may have some beneficial nutrients from decomposed organic matter, but like bagged garden soil, it may be too dense and could also harbor insects, disease, or weeds.

Potting soil is a modified or soilless medium, that is composed of various materials. These mixes may include sphagnum peat moss, pine bark, perlite, vermiculite, or clean coarse (builder's) sand. Some products include water-retaining crystals, which might be advantageous in certain situations. Soil mixes are often amended with slow-release fertilizer. Fertilizer-amended potting soil gives plants a boost in the beginning but will not sustain growth throughout the season. If you are growing organically and want to avoid chemical fertilizers, look for mixes with alternatives, such as bone meal, or lime to adjust acidity if needed.

Since so many products are available, consider the specific needs and watering requirements of your container plantings. Perennials, herbs, and annual flowers tend to prefer soils that are well-drained with more perlite, sand, or bark. Tropical plants and foliage thrive with moist, but not soggy conditions, and succeed with more peat and less coarse material. Purchasing a good quality medium allows you to modify

composition and texture to suit your flora.

Characteristics of Good Potting Medium for Containers

Highly porous for water and air: Larger particles and pore spaces allow rapid percolation of water and air.

Water-holding capacity: Small particles and pore spaces and high quantities of organic matter increase water retention.

Drainage: Large particles and pore spaces allow water to drain quickly. A compacted growing medium does not drain – soil needs to be "fluffy."

Aeration: Large particles and organic matter create air space, providing roots with access to the oxygen that is necessary for a plant to grow, take up nutrients, and absorb water.

Light weight: The lighter a mix is, the easier it is to move the container. A lighter mix has lower bulk density and more air space than a heavier mix.

Fertile: A fertile mix is necessary for healthy growth. Plants need nutrients to thrive.

Pasteurized: A mix that is mostly free of weed seeds, insects, and diseases.

Excerpted from:
North Carolina Extension Gardener Handbook, North Carolina State University

Location, Location

The portability of containers is an asset in any garden. Heavy planters can be adapted with wheels or a trolley. Planters can be shifted to fill in empty spots around the yard or arranged to embellish a family gathering or event. Vegetables craving sun or tender plants seeking shade can be accommodated. You can situate containers to satisfy light requirements, protect from wind, and tackle temperature and moisture variability.

A container garden with a variety of light and warmth.

Start by thinking about microclimates or small spaces with slightly differing light, wind, temperature, or humidity than other areas of your neighborhood or even your own property. You can increase the potential of your container garden by taking advantage of a mini-zone that provides added protection, warmth, and more or less sun as needed. For instance, planters positioned next to a building or fence or in a courtyard will benefit from the heat absorbed by the structure and protection from wind. In reviewing the available lighting, southern and western exposures are the sunniest and warmest; however, the sun's position deviates throughout the year. Satisfying a pot of sun-thirsty plants, such as verbena and heliotrope, may involve two or three moves from May to September. Survey your environment and maximize spaces that offer the best conditions for the plants you select.

After all this careful preparation, it will finally be time to **fill those containers with plants.** But which

plants? **Next month,** we'll discuss all the delightful candidates for your container garden.

Tasks & Tips in the Ornamental Garden

By Cathy Caldwell | May 2019-Vol.5 No.5

Fear of Freezing

If you're like me, May is the month when you look forward to moving your indoor plants outside for their summer vacation. That time in the outdoors always seems to do them a world of good. But ever since my deutzia's blossoms were ruined by a late freeze, I proceed with caution. Since I've been wondering if that old Mother's Day guideline still applies, I did a bit of research. In addition to the usual sources — identified in this month's Tasks & Tips In the Vegetable Garden — I came upon a new-to-me resource at the University of Virginia Office of Climatology, which focuses on the probability of several levels of low temperatures, in addition to that scary 32º mark. This allows you to consider the cold sensitivity of your particular houseplants. It charts this information for a large number of Virginia locations. Of course, the chance of frost is critical if you're planting annuals, too.

Here's a portion of the chart for Charlottesville:

Critical Temperature ºF.	PROBABILITY OF CRITICAL TEMPERATURE OCCURRING LATER IN THE SPRING

	90%	50%	10%
36º	April 4	April 16	April 28
32º	March 29	April 7	April 16
28º	March 12	March 26	April 9

For other localities, see http://climate.virginia.edu/YourVAGrowingSeason.htm. So it's the beginning of May, and I wonder if I should take the risk of a late frost? That would happen only 1 year in 10, right? But I live outside Charlottesville at a higher elevation, so I think I'll wait another couple weeks. That old-fashioned Mother's Day guideline is understandably popular.

Keep on weeding!

My garden has the largest weed population ever — and probably yours does, too. But weeding now, means less weeding later, so do a little bit every day or so.

Water your recent transplants

Don't forget those transplants from last fall. Regular water for a year is necessary for a plant to be well-established.

Add compost

Regular applications of compost seem to work miracles in my garden. There are good scientific reasons for this, of course! See "Backyard Composting With Practical Tips From the Pros," https://pmgarchives.com/article/backyard-composting-with-practical-tips-from-the-pros/.

Sow seeds

Once we reach mid-May, a gardener's thoughts often turn to sowing seeds of annuals directly into the garden. Some easy-to-grow-from-seed annuals are zinnia, cleome, cosmos, morning glory, and hyacinth bean vine. If you've been dreaming of a cutting garden, you can start it now. For detailed directions on preparing your bed and encouraging good seed germination, check out "Growing Annual Flowers," from the North Carolina State Extension, https://content.ces.ncsu.edu/growing-annual-flowers.

Zinnias are easy to grow from seed and make a great cut flower. Photo: Cathy Caldwell

More Tasks and Tips

Review the May Tasks and Tips from prior issues of "The Garden Shed" — and find out whether and how to prune lilacs and peonies, plus how to identify good bugs and bad bugs in your garden: pmgarchives.com/the-ornamental-garden-in-may

Find out what your lawn needs in May:

- http://pmgarchives.com/article/may-lawn-care-2/

- nsvmga.org/Va.Coop.Ext/may-lawns-landscaping.pdf

Review the Virginia Cooperative Extension's tasks and tips lists:

- May Tasks and Tips for P**erennials, Annuals and Bulbs**: nsvmga.org/Va.Coop.Ext/may-perennials-annuals-bulbs.pdf
- May Tasks and Tips for **Trees, Shrubs and Groundcovers**: nsvmga.org/Va. Coop. Ext./Trees_Shrubs_Grnd.pdf
- May Tasks and Tips for your **Houseplants**: nsvmga.org/Va.Coop.Ext/may-interior-gardening.pdf

Be sure to take a break now and then and enjoy your garden's gorgeous new foliage and especially those flowers. Happy Gardening!

SOURCES:

"When Does Your Growing Season Start?" http://climate.virginia.edu/YourVAGrowingSeason.htm