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Growing Raspberries in the Home Garden

By Patsy Chadwick | May 2020-Vol 6 No. 5

WHY GROW RASPBERRIES?

The next best thing to growing your own vegetables is growing your own fruit. Small fruits are generally easier for the home gardener to manage than orchard fruits. Berries, such as raspberries, are popular choices and very rewarding to grow. Unfortunately, the soft fruit is highly perishable and has a short shelf life in stores. That's why it's best to grow your own.

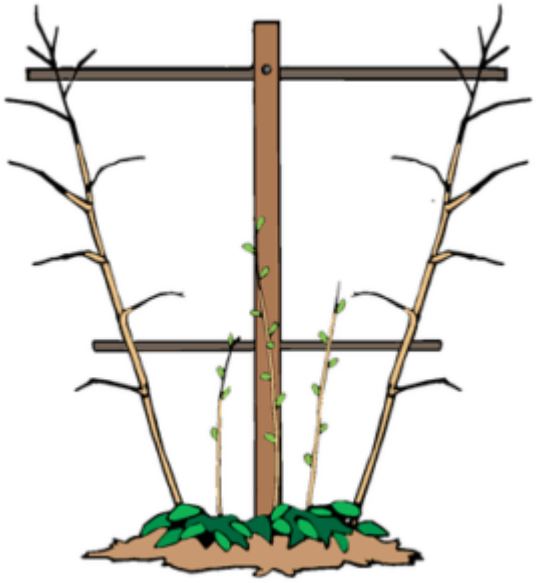
The delicious sweet-tart flavor of fresh raspberries is reason enough to grow them. But if you need further convincing, then consider their health benefits. Raspberries are rich in vitamins and minerals, antioxidants, and fiber. One cup of this tasty fruit provides more than 50% of the minimum daily target for vitamin C, 8 grams of dietary fiber, and only 5 grams of sugar. And that's not all. For a more complete listing of the nutritional and health benefits of berries, check out Oregon State University Extension Service's Berry Health Benefits fact sheets.

WHEN IS A BERRY NOT A BERRY?

Despite the name, raspberries are not actually berries. Blackberries and strawberries aren't either for that matter. In botanical terms, a true berry is a multi-seeded fleshy fruit that develops from a single flower with a single ovary. By that definition, true berries include blueberries, cranberries, elderberries, gooseberries, and lingonberries. Raspberries develop from flowers that have more than one ovary. A raspberry is essentially an aggregate fruit made up of multiple parts clustered around a core. Each little bead-like part, called a drupelet, develops from a single ovary and contains a single seed.

So now that you know what a raspberry isn't, let's talk about what it is. Raspberries belong to the *Rubus* genus, which includes blackberries, boysenberries, loganberries, and tayberries. Members of this genus are called bramble fruits because of the prickles on their stems. Except for some hybrids that have been bred to be thornless, most raspberry varieties are thorny. Raspberry plants are also referred to as caneberries or

cane fruits because the berries form on long thin woody canes.



Primocane-fruiting raspberry with second-year canes and new canes. Courtesy Va. Cooperative Extension

The root systems of raspberry plants are **perennial** and can live for about 5 to 12 years before they need to be replaced. The shrub-like plants produce a thicket of green vegetative canes that are **biennial** and live for only two summers. In their first year, the green canes are referred to as **primocanes**. In their second year, the canes, now mature and browner in color, are referred to as **floricanes**. Floricanes leaf out in spring, produce flowers, and set fruit. Once they finish fruiting, the canes die. For pruning purposes, it's important to know the difference between a primocane and a floricane. But more on that later.

CHOOSING WHICH RASPBERRIES TO GROW

Raspberries fall into three broad categories identified by color: red, black, and purple. Of the three, red raspberries are generally more successful in warmer areas of Virginia, whereas all raspberry types may be successfully grown in cooler mountain regions of the state.

RED (*Rubus idaeus*). Red raspberries are native to most of the temperate regions of earth including North America. Red-fruited raspberries sucker from their roots and spread. Most of the fruit is concentrated in the top one third of shoots, which benefit from being trellised. Red varieties fall into two basic types: summer-bearing and everbearing (sometimes called fall bearing).

- **Summer-bearing varieties bear one crop** of fruit. Members of this type follow the traditional biennial life cycle of a bramble fruit: They send up green shoots (primocanes) their first year and bear fruit the following year on floricanes in mid-summer. The canes die after fruiting.
- **Everbearing varieties bear two crops** of fruit and are often referred to as primocane varieties. That's because they bear fruit on the mature tips of first-year growth in late summer through fall. They can also produce a small crop in summer on the second-year canes, just below the area where they produced fruit the previous fall.

Some suggested red raspberries to grow include:

- **Heritage** — Resistant to most diseases but susceptible to late leaf rust. The thorny canes are very vigorous, erect, and sturdy.
- **Himbo Top** – Has an upright form and a high tolerance to *Phytopthora* root rot disease.
- **Joan J** – Has thornless canes that are vigorous and upright.
- **Josephine** – A vigorous, upright selection that needs little, if any, support. Resistant to leaf hopper and *Phytophthora* root rot.
- **Caroline** — Has vigorous canes with short fruiting laterals and moderate to good resistance to *Phytopthora* root rot.

Yellow or gold-color raspberries belong to the red raspberry category, are similar in growth habit, and should be treated the same as any other red raspberry. The yellow or gold fruit color is a mutation, which prevents production of the pigment normally found in red raspberries.

Suggested yellow or gold-color varieties include the following, which are both everbearing varieties:

- **Anne** – Largest and best-tasting of the yellow varieties.
- **Fall Gold** — A more compact variety with upright, thorny canes topping out at about 24” to 36”.

BLACK (*Rubus occidentalis*). Black raspberries are native to North America but have only been domesticated since the mid-1800s. By the way, don’t confuse black raspberries with blackberries. They are two separate species belonging to the *Rubus* genus. To tell the plants apart, black raspberry canes grow more upright whereas blackberry canes grow long and arching. When harvesting the fruit, the core of each raspberry remains attached to the stem, leaving the berry with a hollow middle. The blackberry core detaches from the stem along with the berry and is part of the edible fruit.

Black raspberry varieties bear fruit a little earlier than the red varieties but tend to be more susceptible to viral diseases than the red varieties. They grow new canes from the crown rather than from root suckers. The tips of black raspberry canes need to be pruned to encourage branching and thus more berries.

Black raspberries ripening on the vine.

Examples of black raspberries include:

- **Cumberland** – A long-favored vigorous, productive floricane-bearing variety.
- **Jewel** — A high-yielding, floricane-bearing selection. Plants have a weeping form and are cold hardy, vigorous, and resistant to most diseases.
- **New Logan** — A heavy-yielding selection that withstands drought conditions well.

PURPLE (Hybrids). The members of this category were recognized as hybrids of red and black raspberry species as early as 1870. Their berries are not as sweet as those of their two parent species and are best used for processing into jams and jellies. Like their black raspberry parent, they produce their canes predominantly from the crown. However, like their red raspberry parent, they may form suckers from their roots. Members of this category should be grown in the same manner as black raspberries.

Examples of purple raspberries include:

- **Brandywine** — Considered one of the best of the purple raspberry selections. It produces tart, reddish-purple fruit on tall, thorny canes.
- **Royalty** — The most widely planted purple variety. The soft, sweet flavored fruit is borne on productive upright, thorny canes and enjoyed fresh as well as processed.

ESTABLISHING RASPBERRY PLANTS IN THE HOME GARDEN

Plant raspberries in late fall or early spring in deep, well-drained soil that is rich in organic matter. Before planting raspberries, have the soil tested about 4 to 6 months in advance. This will allow plenty of time to amend the soil based on soil test results. The Virginia Cooperative Extension (VCE) recommends a pH of 6.0 to 6.5. If the pH is too low, it should be raised to the level suggested by the soil test with dolomitic lime.

Space the plants 3 feet apart for red raspberries and 4 feet apart for black or purple raspberries in rows 8’ to 10’ apart. Prepare planting holes that are large enough to allow the roots to spread out naturally. Position the crown of the plant (where the stem and root come together) one inch below ground level.

Tamp the soil firmly around each plant to remove air pockets from the roots.

Water each new plant well immediately after planting. Water is also critical to raspberries when they are blooming and when the berries are developing. However, avoid overly saturating the soil. Waterlogged soil can increase susceptibility to root rot and other diseases. If the soil does not drain well, consider planting raspberries in raised beds. For best results, use drip irrigation to confine water to the root area.

Use an organic mulch to cover the soil. That will keep the soil moist and cool as well as reduce soil crusting and help control weeds.

Apply fertilizer only as the results of a soil test indicate. Too much fertilizer can cause excess vegetative growth and a decrease in fruit quality. If fertilizer is needed, apply about 0.5 pound of nitrate of soda or 0.75 pound of 10-10-10 per 100 square feet.

PRUNING RASPBERRIES

It’s important to remove old second-year canes to make room for new first-year canes. This helps prevent disease and promote plant vigor. To tell the difference between old and new canes, older ones are grayish brown in color and have rough-looking, peeling bark. New canes are smooth and green.

Prune dead canes of both summer fruit-bearing and everbearing red raspberry plants in late winter or early spring before new growth emerges. Also prune any small, spindly, or damaged canes. Continue to thin out canes leaving only the thickest, healthiest ones. When you finish, you should have only three to five canes per linear foot. The recommended row width is 1-1/2 to 2 feet. If you want to confine your plants to that width, prune out any new canes that you see growing outside those boundaries.

When pruning everbearing raspberry plants, some gardeners prefer to mow or cut down ALL the canes before new growth emerges. While this makes the pruning task a lot simpler, it does sacrifice the mid-summer crop. This may not be too big a sacrifice since the summer crop is usually small and the larger crop occurs in late summer through fall on these varieties.

The canes of black and purple raspberry plants tend to grow longer than those of the red varieties. As black raspberry canes arch over, they can form new roots where their tips touch the ground, resulting in overcrowding. To prevent this from happening, snip off the top 2 or 3 inches of stem growth in summer when the new canes are about 30” long. This will solve the rooting problem, keep the canes at a more manageable height, and encourage the development of more lateral shoots and fruit buds. Cut dead two-year canes back to the ground in late winter or early spring.

TRAINING RASPBERRIES

Everbearing raspberry varieties tend to be more erect than summer-bearing varieties and rarely need to be trained to a trellis. Summer-bearing varieties may need support as fruit production weighs down the canes. One common method is to install sturdy wood or metal posts with supporting crossbars at either end of the row. Stretch wire between the crossbars on both sides of the plants about 3 feet above the ground to confine the canes. If necessary, attach canes to the wires with twine. Another method is to train the canes along an existing fence. A third method is to tie the canes to stakes. For more information on trellising methods, see Small Fruit in the Home Garden.

HARVESTING AND STORING RASPBERRIES

Raspberries are ready to pick when they separate easily from the core. Harvest early in the day when temperatures are coolest and after the dew has dried. Because the fruits are fragile, layer them in shallow containers no more than 3 to 4 berries deep. Don't wash the berries until you're ready to eat them. Refrigerate the unwashed berries immediately in air-tight containers. If you pick more raspberries than you can use within the next few days, freeze them in a single layer on a baking sheet for a few hours. Once the berries are frozen, transfer them to freezer containers and store for up to 10 months.

RASPBERRY DISEASES

Raspberries, particularly the black varieties, are subject to a number of viral and fungal diseases. Viruses are commonly transmitted to plants by aphids or nematodes. Once a raspberry plant is infected with a virus, remove the plant and destroy it.

Of the various fungal diseases — such as cane blight, gray mold, anthracnose, or *Phytophthora* root rot — *Verticillium* wilt is the most problematic for raspberries. A soil-borne fungus, it enters susceptible plants through their roots, spreads through the plant's vascular system, and causes the leaves to die. Affected plants should be removed and destroyed.

To prevent viral and fungal diseases in raspberries:

- Purchase certified virus and *Verticillium* wilt-free planting stock.
- Avoid planting raspberries where other plants infected with wilt were previously grown.
- Space plants properly for good air circulation and exposure to light.
- Make sure the soil drains well to prevent root rot diseases.
- Mulch around roots to prevent fungal spores from splashing up on foliage.
- Replant with quality stock about every 5 to 7 years.
- Remove any wild bramble fruit plants from the vicinity of your garden.
- Remove and destroy pruned raspberry canes. Don't add them to the compost pile.

RASPBERRY PESTS

Japanese beetles commonly flock to raspberry plants in mid-summer, skeletonizing leaves and chewing holes in the berries. At the first indication of damage, start hand picking the beetles early in the morning when they are sluggish and drop them into a pail of soapy water. Spider mites weave webs around the leaves and canes and feed on plant tissue by sucking out the plant juices. Their damage results in yellow spots on the foliage. A sharp spray of water or insecticidal soap should kill the mites. Cane borer damage is indicated by wilted raspberry cane tips. To prevent the borers from tunneling down into the canes where they will overwinter, cut off the cane tip about an inch below the wilted portion.

SUMMARY

Growing raspberries is rewarding and easy to do. Although best eaten fresh right off the plant, they make a tasty, healthy addition to salads, desserts, and even savory dishes. Add them to fresh spinach or mixed green salads for a sweet-tart pop of flavor. Incorporate them into a mixed-berry fruit salad with blackberries, blueberries, and strawberries. Combine them with other salsa ingredients to serve with chicken or shrimp. For a sweet treat, bake them in muffins and enjoy with your morning tea or coffee. Make a fresh berry sauce to serve over ice cream or as an accompaniment for desserts with lemon or chocolate flavors. Blend frozen raspberries with peaches, mango or other fruits to make a nutritious, vitamin-rich smoothie. No matter how you use them, make raspberries an important part of your diet.

RESOURCES:

Homegrown Berries, Timber Press, 2014

"Small Fruit in the Home Garden," Virginia Cooperative Extension Publication 426-840 https://www.pubs.ext.vt.edu/426/426-840/

"Japanese Beetle Pest Management in Primocane-Bearing Raspberries," Virginia Cooperative Extension Publication 2909-1411 (https://www.pubs.ext.vt.edu/2909-1411)

"Raspberry Cane Borer," North Carolina State Fact Sheet (https://content.ces.ncsu.edu/raspberry-cane-borer)

Oregon State University Berry Health Benefits Fact Sheets, (http://berryhealth.fst.oregonstate.edu)

Chocolate Tart With Raspberries

By Patsy Chadwick | May 2020-Vol 6 No. 5

Raspberries and chocolate are a classic dessert pairing and a fantastic way to use up some of those luscious berries from your garden. This tart is incredibly easy to make. Better yet, it can be made a day in advance.

Crust:

2 cups toasted pecans

6 Tablespoons golden (light) brown sugar (packed)

1/4 teaspoon ground cinnamon

4 Tablespoons unsalted butter, melted

Tart filling:

3/4 cup whipping cream

6 ounces bittersweet or semisweet chocolate, chopped

Fruit topping:

1 pint (or more) raspberries

1/4 cup seedless raspberry jam

Directions:

Preheat oven to 325°F. Finely grind pecans, sugar, and cinnamon in food processor. Add butter and process until moist clumps form. Press dough onto bottom and up the sides of a 9-inch tart pan with removable bottom.

Bake crust until golden brown and firm to touch, about 25 to 30 minutes. Transfer to a rack and cool completely.

Bring cream to simmer in a medium-size saucepan. Remove from heat and add chocolate. Stir until the chocolate is melted and smooth. Pour the chocolate mixture into the cooled crust. Chill until set, about 1 hour. If making this tart a day in advance, cover and keep it chilled until you are ready to add the raspberries on top.

Arrange the raspberries over the top of the tart so that they are just touching one another.

Stir the jam in a small saucepan over low heat until it is melted. Carefully brush the melted jam over the raspberries. This step may be omitted, but the jam does give the raspberries a pretty glistening effect.

Optional: Sprinkle some shaved chocolate curls over the raspberries before serving the tart.

Serves 6 to 8.

NOTE: *This recipe was adapted from one that appeared in Bon Appetit magazine about 25 years ago.*

Mayapple

By Cathy Caldwell | May 2020-Vol 6 No. 5

The mayapple (*Podophyllum peltatum*) is a native perennial found in either moist or dry woods in Virginia and most of eastern North America. Perhaps you're lucky enough to have them; if not, keep an eye out for them on a forest walk. It's an unusual plant with an unusual story. The leaves — which look like tiny umbrellas — unfold from a single stem and they are either single or a pair of leaves. Only plants with two leaves will bloom in any given year. The flowers, which are white in color and quite lovely, are mostly hidden under the leaves, which are fairly large and may reach a foot in diameter. In the wild, mayapple is usually found under deciduous trees, where it tends to create large colonies via rhizomes. And in my yard, that is exactly where it is located and how it behaves.

A colony of mayapples
Photo: Cathy Caldwell

It was many years before I learned that there were Mayapples on my property; they were hiding in an area of mostly invasives, and it was only when we set about clearing those invasives that we discovered the Mayapples. Actually, the discoverer was the knowledgeable fellow helping us with the clearing; he was familiar with them and we sensed his excitement about this find. Nowadays I eagerly look forward to the stems as they push up through the earth in early spring. They're worthy of daily inspection so you can catch the enchanting sight of unfurling leaves. But these plants are **very toxic,** so gardeners with young children may wisely avoid planting them.

Mayapples prefer moist, acidic soil but can withstand drought, dry soil, and black walnut. They do not like competition from other plants, nor do they like mowing. Mayapple plants are available from online purveyors of native plants as well as from some local retail sources, including Monticello, www.monticelloshop.org/may-apple-podophyllum-peltatum and other native plant nurseries.

Eastern box turtle
Photo: Andrea Janda

Mayapples are quite difficult to propagate from seed, on top of which, they seem to have difficulty producing seed at all, mostly because they attract very few pollinators, and also because the plant is not self-fertile. If a plant does manage to produce seed, it is not likely to germinate — as some scientists discovered to their dismay. These scientists had a little better luck with seeds sown with fresh mayapple fruit pulp. Other scientists have reported that **seeds that had been ingested by turtles germinated faster** and had a higher probability of success. If you'd like to read more about this research, take a look at "Mayapple: A Review of the Literature from a Horticultural Perspective," www.researchgate.net/pub,228502025. Despite the pessimistic research results, my own experience suggests there's room for optimism on seed germination. Otherwise, why would a few mayapples suddenly appear in a grassy area fairly far from my colony? I'm guessing I got a helpful hand from a turtle.

The Mayapple does not make a great border plant because it goes dormant in the summer and because the blossoms are mostly hidden. But they're terrific for a wild or woodland garden, and they make a lovely ground cover under deciduous trees, so long as you don't mind their disappearance as summer progresses. A gardening friend came up with a brilliant location for her Mayapple — on the edge of a retaining wall that lined a walkway beneath, so the flowers were at eye-level. From the vantage point of her walkway, you can watch the blossoms turn to the fruits — the "apples" as it were.

Mayapple blossoms
Photo: Cathy Caldwell

Since Mayapples are very effective colonizers via underground rhizomes, a gardener need not worry about propagating using seeds. Once you've got a colony going, you'll be able to transplant a few to a new location. I've tried this myself, and can confirm the recommendation that success depends upon taking more than one underground node.

The fruit — the "apple" — of Mayapple is lemon yellow. Photo: Albert Herring of Va. State Parks.

Since deer and rodents do not bother Mayapples, I should have guessed this: **All parts of the Mayapple are POISONOUS –**– though the fruits are supposedly not toxic when they are fully ripe. A leading horticulturist, A.S. Weakley, says: "The ripe fruits are edible; the rest of the plant contains a variety of alkaloids, and is poisonous-medicinal. Compounds from *Podophyllum* are used in wart removal, and show anti-viral and anti-cancer promise." (Weakley 2015). But please DO NOT eat those apples! Scientists may be able to determine when a Mayapple fruit is fully ripe — and thus not poisonous — but don't try this yourself.

That term "poisonous-medicinal" is kind of a head-scratcher, but the more I learn about plants, the more there is to learn. What makes Mayapple unappealing to garden munchers can also be used to kill cancer cells; that's an over-simplification, but a decent summary. It's really no surprise that about half the new drugs on the market come from plants. In the case of Mayapple, a Himalayan variety (*Podophyllum hexandrum)* was the original source of podophyllotoxin, a cytotoxic compound that's the starting point for an anticancer drug called Etoposide. The drug has been used since 1983 to treat dozens of different cancers, from lymphoma to lung cancer. Today, the Himalayan relative is endangered, and drug manufacturers turned to the American Mayapple, but the supply of podophyllotoxin remained low. Scientists recently developed a bio-engineered source for podophyllotoxin, and I will not attempt to explain that here, though if you're curious, you can read about it in the journal *Science,* cited below.

For a native perennial that will colonize nicely as a ground cover under trees and will not be munched by deer, the Mayapple can't be beat.

SOURCES:

www.missouribotanicalgarden.org/PlantFinder/Podophylum peltatum

www.north carolina wildflower.org/podophyllum-peltatum

"Mayapple," http://www.indefenseofplants.com

"Genetic Engineering Turns a Common Plant into a Cancer Fighter," *Science (*Robert F. Service*, Sep. 10, 2015)*
,https://www.sciencemag.org/news/2015/09/genetic-engineering-turns-common-plant-cancer-fighter

"Fighting Cancer While Saving the Mayapple," https://www.researchgate.net/publication

Upcoming Events

By Susan Martin | May 2020-Vol 6 No. 5

Master Gardener College

Virginia Tech
Blacksburg Virginia
June 25-28, 2020

Master Gardener College will take place online year using ZOOM videoconferencing. This format presents a wonderful opportunity for Master Gardeners who have never attended this event at Virginia Tech's campus in Blacksburg. Registration is $50, and of course there are no travel expenses. When you register for College, you have the option of attending sessions live AND watching recorded sessions later. Once all session recordings are posted, you will have access to 20+ sessions! **Registration will start in early May.** Click here for more information and to register.

Virginia Cooperative Extension Webinar

Vegetable Gardening Resources

https://video.vt.edu/media/1_8a3li9d2

Designing for Nature at Home: Two Experts Converse

Douglas Tallamy and Larry Weaner
Co-sponsored by: New Directions in American Landscaping (NDAL), The American Horticultural Association (AHA), and Wild Ones – Native Plants, Natural Landscapes
Thursday, May 28th
1:30 – 2:30 PM EST

Interestingly, the most influential person in contemporary garden design today may very well be entomologist Douglas Tallamy. By bringing popular attention to inextricable links between native flora and fauna, Douglas has changed how countless people garden. Nationally acclaimed Landscape Designer Larry Weaner will interview Douglas about the fine points of residential-scale habitat creation. Larry and Douglas will also compare notes on their experiences engaging with landscapes and gardeners through the lenses of their respective disciplines. Cost is $25.

Register now

Blue Ridge PRISM **(Partnership for Invasive Species Management)**

Invasive Plant Workshops

Event planning needs to remain flexible in the face of Covid 19. The May and June PRISM events have already been switched to a FREE videoconferencing format through ZOOM. Registration is still required. For events planned for dates after June 30, refer to the website for updated details.

Blandy Experimental Farm – Boyce
Saturday May 30 (1:00 – 5:00pm) – REGISTER HERE (ZOOM VIDEOCONFERENCING)

Wednesday October 7 (1:00 – 5:00pm) – REGISTER HERE

Ivy Creek Natural Area
Saturday June 20 (1:00 – 5:00pm) – REGISTER HERE (ZOOM VIDEOCONFERENCING)
Thursday October 22 (1:00 – 5:00pm) – REGISTER HERE

Rockfish Valley – Nellysford
Wednesday June 10 (1:00 – 5:00pm) – REGISTER HERE (ZOOM VIDEOCONFERENCING)

Piedmont Master Gardeners

Most Public Events Have Been Cancelled, including the May and June Through the Garden Gate tours. However, the Garden Gate tours for July and September are still on the schedule at this time. Be sure to check back to ascertain the status of those tours before heading out the door.

Through the Garden Gate
The Garden at Cargil Lane
Saturday, July 11
9:00 am – 12:00 noon
718 Cargil Lane
Charlottesville, VA 22902

Built in 1938, the original house had extensive gardens and a greenhouse that,over time, became abandoned and overrun by wild grape and wisteria. Ten years ago, the owners began to clear the overgrowth, and design and plant the one-acre property. It borders a pond and stream, so wildlife is plentiful. A deer fence installed in 2019 has made a significant difference in planting options and protects a water garden; outside the fence, the garden features deer-resistant plants. No registration is required. Admission is $5 and can be paid at the garden. For more information, click here.

The Nature Foundation at Wintergreen

40th Annual Spring Wildflower Symposium
3421 Wintergreen Drive
Roseland, VA 22967
Phone: 434-325-8169; Email: info@twnf.org

Originally scheduled for May 15-17. NOW scheduled for first weekend in October

Check here for details.

At-Home Activities

Although we may not have the comfort of our regular routines, the interruption might be used to try out new activities. Work on projects that will enhance the biodiversity and environmental health of your property:

- plant native species (see this link for plants native to the Piedmont)
- weed out invasive species
- create pollinator habitats
- learn how to build houses for bluebirds or mason bees
- decrease lawn area with plantings
- build a brush pile to benefit wildlife (see this link for details)

Our thanks for these suggestions to our friends in the Rivanna Master Naturalists Chapter.

In the Ornamental Garden — Tasks & Tips for May

By Cathy Caldwell | May 2020-Vol 6 No. 5

The Piedmont Master Gardeners website has a **new feature**: monthly gardening tasks and tips are now appearing under **Gardening Resources** on the main page of the PMG website. For more May tips, take a look at Gardening Resources/Monthly Gardening Tips/Piedmont Master Gardeners

Here's our **To-Do List for May**:

- To encourage fuller, sturdier **asters and chrysanthemums, pinch them back by about a third this month** and again in June or early July. **Pinch back chrysanthemums** as soon as the new shoots are 4 to 6 inches long. Just grasp the growing tip and pinch about ½ to 1 inch of

the stem back to a leaf node. The plant will push out new branches from these nodes. Those branches in turn will need to be pinched back by the early part of July.

- **Irises** are at their peak this month, but the spent blossoms can turn to a gooey mess, especially after a rainstorm. As you **snap off each spent iris blossom**, be careful not to break off any unopened buds. Removing the spent blossoms not only tidies up the plant but also prevents it from setting seed. After the last flower starts to fade, cut off the flower stalk at the base with a sharp knife. Sterilize the knife between cuts to prevent spreading disease among the plants.

- **As cool season plants such as violas or pansies begin to wane,** replace them with **heat-loving plants**. *Melampodium* (butter daisy), *Gomphrena* (globe amaranth), annual *Salvia* (sage), *Zinnia*, *Tithonia* (Mexican sunflower), *Lantana*, *Tagetes* (marigold), *Cleome* (spider flower), and *Verbena* are a few "tough-as-nails" annuals that are generally heat and drought tolerant in this area. Direct sow seeds now or, if you're transplanting seedlings, make sure they are hardened off before you plant them.
- **Stake tall-growing plants** that are susceptible to wind damage. Loosely tie the plant to the stake in a figure-eight configuration with the knot against the stake (not the stem of the plant).
- **If mosquitoes are a problem**, incorporate **plants that naturally repel them** such as scented geranium, lemon balm, southernwood, catnip, nicotiana, marigold, lemon thyme, peppermint, and lavender.

Direct sow seeds of annuals such as cosmos, marigolds, cleome, gomphrena, or zinnias in the early part of May. Later, when the plants reach 4 to 6 inches in height, pinch them back to promote bushier growth. This will ultimately produce more flowers.

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

- **Transplant bedding plants on a cool, calm, cloudy day.** The cooler temperatures and cloud cover will cause less stress to the plants and will help them settle in sooner. Also, pinch off any buds or open blooms so that the plant will concentrate its energy into root development. A little delayed gratification now will mean a healthier, more floriferous plant later.
- **Provide adequate water to newly-planted seedlings and transplants** and protect them from drying wind and hot sun until they establish good root structures. This is particularly important during the first few weeks for healthy root development. Lack of moisture is one of the key reasons young plants die before they become established. If the root ball dries out, the plant may not recover from the stress. Too much water is just as bad for seedlings and

transplants because soggy soil may cause their roots to rot.

- **Monitor moisture requirements of newly-planted trees.** In general, **it takes 2 to 3 years for a tree to become established** in the landscape. Adequate moisture is particularly critical during this period to encourage healthy root development beyond the original root ball. Don't take it for granted that light spring rains will provide enough moisture at the root level. In the absence of good soaking rains, provide supplemental water, particularly as daytime temperatures grow hotter. Cover the entire area under the tree canopy to keep the soil evenly moist — but not soggy — around the root ball and surrounding soil. Too much water can be as detrimental to the health of a tree as too little.
- **Snip off the seed heads of daffodils** and other spring-flowering bulbs after the flowers are finished but leave the foliage alone so that it continues to photosynthesize. Just let it die back naturally. TIP: Plant some fast-growing annuals nearby so that they can camouflage the dying bulb foliage. Petunias, lantana or verbena are good choices for this purpose.
- **Prune spring-flowering shrubs** after they finish blooming. If you put off doing this until later, you run the risk of cutting off buds for next year's blooms. Virginia Cooperative Extension (Va. Coop. Ext) Publication 430-462, "Shrub Pruning Calendar" (pubs.ext.vt.edu/430/430-462) provides guidance on the best time of year to prune a variety of shrubs. And for expert guidance on pruning, be sure to review a recent *Garden Shed* article on that topic: A Pruning Primer, The Garden Shed, Feb. 2020.
- **It's time for your houseplants to move outside** for their summer vacation. You can safely move them once night-time temperatures are stabilizing above 50° F. To get the plants ready for their summer home, water each one thoroughly. Rinse off the foliage with room-temperature water to remove dust and dirt that may have accumulated over winter. Groom each plant by removing any dead or dying leaves. Re-pot any plants that have outgrown their pots. For plants that don't need to be re-potted, top off the soil with an inch or two of fresh potting soil. Gradually acclimate the plants by placing them in a shady location initially while they adjust to brighter light.
- **Start inspecting plants for signs of disease or pest damage.** Address any little problems before they become big ones. Lots of April showers can lead to spots on leaves, fungal rots, and the like. One common fungal disease among rhododendrons and a number of other shrubs is Botryosphaeria dieback. To see what it looks like and to learn more about it, watch this video from Va. Cooperative Extension: Video: Botryosphaeria Dieback – Common Plant Diseases in the Landscape and Garden

- **KEEP ON WEEDING!** You're lightening your weed load for next year.

For more May tips, take a look at Gardening Resources/Monthly Gardening Tips/Piedmont Master Gardeners

Integrated Pest Management

By Cathy Caldwell | May 2020-Vol 6 No. 5

When I first heard the term “Integrated Pest Management,” the word *management* grabbed my attention. Was it really possible to manage pests? In my garden, it seems that the pests are managing me. But seriously, pests are no laughing matter. Frankly, the sight of holes swallowing up the leaves of a beloved plant are more likely to bring on a bout of sobbing. And then, you find yourself wishing that there was something you could just spray on the plant that would solve the whole problem — without hurting your plant or the environment. Sorry to say, there’s rarely an easy and safe solution like that. But by increasing our knowledge base of insects, we gardeners can develop confidence in our ability to solve a pest problem in an effective way that does the least possible harm. That’s the basic idea of Integrated Pest Management.

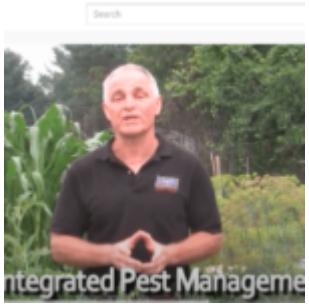
By now, most of us are well aware of the harm that conventional pesticides can cause, from contamination of water supplies to the devastation of pollinators, to name just a few. These concerns led to the principles of Integrated Pest Management (IPM), which “integrates” various tactics — i.e., by combining preventive measures with biological and mechanical controls to reduce the need for chemical pesticides — and making that insecticidal spray a last resort. As the Cooperative Extension Service recently put it:

> "the goal of IPM is often not to eliminate the pest population, but to "reduce" it to levels that are considered acceptable (or "below threshold levels"). Using an integrated pest management program helps promote a more balanced ecosystem.
>
> — "An Introduction to Integrated Pest Management," Va.Coop.Ext. Pub. ENTO-365.pdf (2020).

It's worth noting that the principles of Integrated Pest Management (IPM) have been adapted for use with other problems, including plant diseases and weeds.

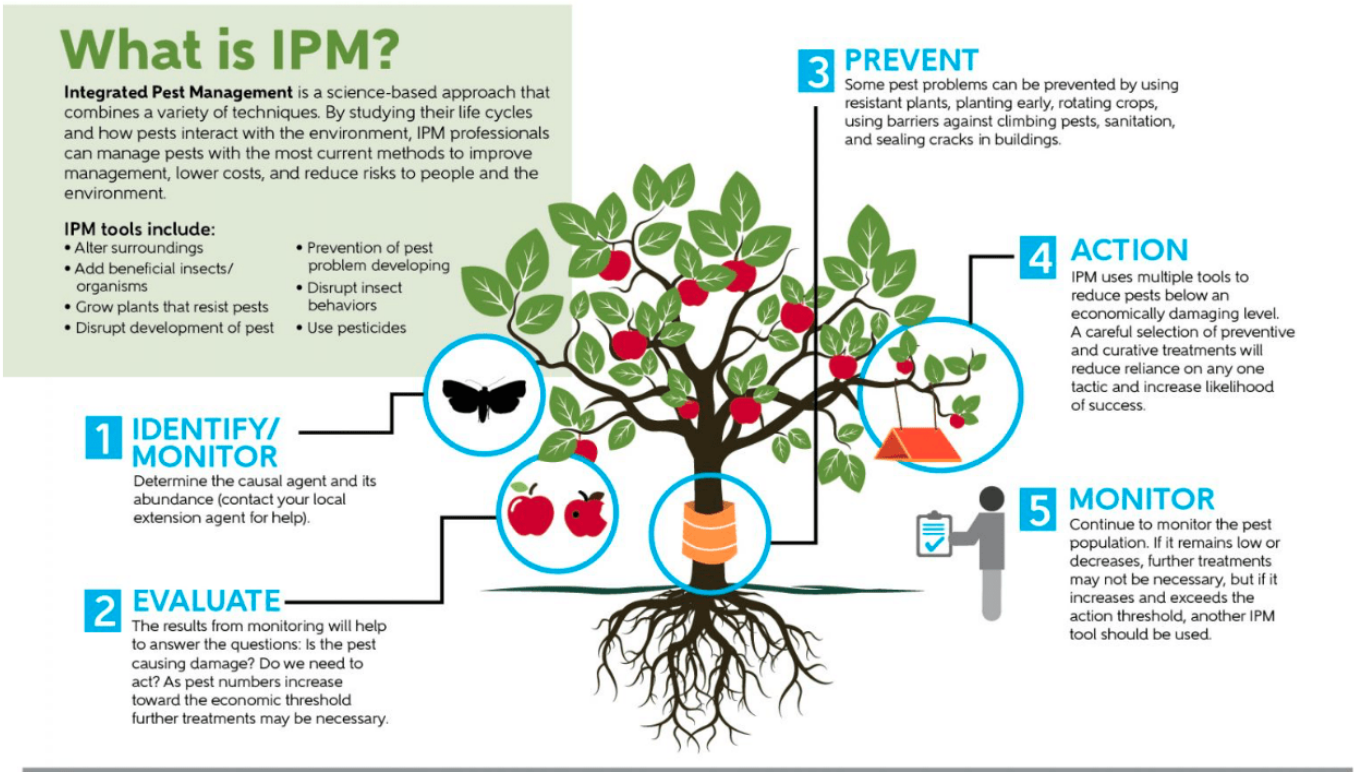
But what exactly *is* IPM? Here's one of the best descriptions I've come across:

> *IPM does not mean simply switching from chemical pesticides to organic pesticides. Nor does it mean eliminating the use of all chemical pesticides completely. IPM can and may include the use of some chemical pesticides. According to the National Coalition on IPM, 1994, "**IPM is a strategy** that uses various combinations of pest control methods, biological, cultural, and chemical in a compatible manner to achieve satisfactory control and ensure favorable economic and environmental consequences." **IPM is not one single action, it is a process, a series of steps that must be carefully thought out ahead of time.** Each step depends upon the given situation, the given pest and your given ability, both physically and financially, to accomplish all of the steps.*
>
> — Clemson Coop.Ext. Fact Sheet, IPM, Clemson.edu



"The Bug Guy" of the University of Maryland explains IPM.

If you'd like to watch a video covering the basics about IPM, just follow this link: IPM Basics with the "Bug Guy" of Maryland Coop. Extension.



Courtesy of the Entomological Society of America

What are the steps in the IPM process? Let's say you've noticed a problem in your garden — perhaps a plant that looks chewed or a whole row of vegetable plants that look troubled. Most IPM adherents would say that **noticing the problem early** is a key step in the IPM process, so regular **monitoring** is a critical element. Farmers who employ IPM "scout" their rows regularly for problems, and we home gardeners need to do that, too, so we can formulate a solution before too much damage is done. Once you've spotted the problem, your next step is to identify the pest.

1. Identify the Pest and Learn More About It

Correctly identifying your pest is a critical first step. A mistake in identification can lead to ineffective control tactics that waste time and money and may lead to unnecessary risks to the environment or people; even worse, you could end up wiping out a beneficial insect that might have controlled your pest all by itself. I have to admit that this first step did not appeal to me, since getting up close and personal with bugs is not an activity I would ever choose. However, I experienced a feeling of victory when I correctly identified the pest that was eating my rhododendron. And I never even spotted the actual culprit! In my case, the type of damage visible on the plant was a clear pointer to the particular pest involved.

A little time on the computer reading up on the typical pests that harass your particular plant, studying photos of the damage caused, and learning about the pest's life cycle will often enable you to make a positive ID. Be careful in your amateur sleuthing; when I turned over the leaves of my struggling plant, I came across several tiny insects, and at first I thought I'd found the culprit. However, when I came across two different types of insects on the same leaves, it occurred to me that one of them could be a beneficial — an insect which likes to eat the pest.

For help in identifying a pest, try the following resources:

- **Use an online photo guide.** There are several extremely helpful online photo-based identification resources that show the insect at various life stages and the type of damage they cause:

For vegetable garden pests: Purdue Entemology Extension/ Radical Bugs and NC State/Insect & Related Pests of Vegetables

For tree and ornamental pests: https://www.pubs.ext.vt.edu/Insect Pests of Ornamentals Slide Show

For lots of photos and a clickable guide: Bug Guide.net, hosted by Iowa State University Dept. of Entomology

- **Use Extension resources**: For detailed information and accompanying photos on a long list of pests, check this extensive listing of pest publications from Virginia Cooperative Extension: Resources for Garden Insect Pests, Va.Coop.Ext.
- **Use the Pest Management Guide**: Virginia Tech produces an annual Pest Management Guide, and until I actually consulted it, I assumed it dealt only with chemical pesticides, but it is much broader than that. It contains a wealth of information about both pests and diseases, using an IPM approach to effective treatments. Pest Management Guide 2020/Va.Coop.Ext./Pub. No. 456-018/ENTO-336.pdf. For example, it contains an extensive **Index to Insects and Mites by Host Plant** in chapter 4.
- **Get expert help.** If you're having trouble identifying your pest — and especially if there appears to be more than one pest — call on the experts. Start by contacting the Help Desk at the Extension Office, and they will refer your problem to the appropriate extension experts at Virginia Tech.

Once you've identified your pest, you may already have learned plenty about it — such as its biology, habitat and life cycle. That knowledge base about your pest can be used to develop management tactics to combat the pest problem. In other words, you can use what you've learned about your enemy to defeat it — or at least keep it at an acceptable level.

2. Choose a strategy

The Pyramid of IPM Tactics shown above is a useful guide in choosing an intervention strategy from the four main categories: cultural, physical-mechanical, biological, and chemicals. As you move from the bottom of the pyramid, the level of intervention and toxicity increases. IPM is a decision-making process, so once you've identified your pest, you can **review the tactics available for a number of particular pests in the Pest Management Guide** published each year by Virginia Tech and the Virginia Cooperative Extension. 2020 Pest Management Guide

Obviously, altering the cultural situation of a plant is not always possible after the pest problem develops, but using best cultural practices is clearly the best prevention tactic. If you're dealing with a pest problem right now, you'll want to start by looking at physical and mechanical strategies.

Physical-Mechanical Strategies

- **Handpicking**

If you're sure it's a pest — and not a beneficial insect — handpick as many as you can. You can drop the insects and egg clusters into a coffee can or quart jar containing some water and a bit of dish detergent.

- **Traps**

There are traps that are effective for certain pests. You're probably familiar with the use of a dish of beer as a trap for slugs. Yellow plastic dishpans filled with soapy water can attract aphids. Whiteflies and cucumber beetles can be trapped on homemade sticky traps, using boards painted yellow and lightly coated with oil or grease. Commercial sticky traps are available, too.

- **Barriers**

Mechanical barriers can help to exclude some pests, but may not be effective if the pest population is large. Row covers and netting are two common barriers used by vegetable gardeners. Net-covered cages can be placed over young seedlings to help prevent insect, bird, and rabbit damage. Home gardeners sometimes have success with homemade barriers, such as collars made of cardboard, tin cans, or aluminum foil. Sticky barriers on the trunks of trees and woody shrubs may prevent damage from some crawling insects, and some commercial ones are available.

Kaolin clay — which is sometimes referred to as "China clay" — can be used to form a preventive film on leaves and fruit to protect plants from the Colorado potato beetle, tarnished plant bug, leafhopper, mite, thrips, flea beetle, and Japanese beetle damage. Mix 1 quart of clay with 2 gallons of water and 1 tablespoon of liquid soap in a sprayer. Continuously agitate the sprayer to prevent clumping of the clay. Reapply every one to three weeks. This barrier is preventive; it will not work if an insect pest is already established.

- **Water Sprays**

Spraying infested plants with a strong stream of water can dislodge and kill many spider mites, aphids, and other relatively fragile insects.

Biological Strategies

Most gardeners are familiar with some biological strategies, such as encouraging beneficial insects like parasitoid wasps and other predators. Praying mantises and lady bugs are well-known beneficials, but there are plenty more, including ground beetles, lacewings, wheel bugs, hover flies, and predatory mites. It may take some research to identify the beneficials that are an effective tactic for your particular pest.

Tomato hornworm and brochidwasp parasites. Photo: Connie Schultz, CC by 2.0

The best overall approach is to create an environment that attracts and supports a number of naturally-occurring predators and parasitoids. In order to do this, you'll need to put up with some pests in the yard; just think of them as food for the beneficial insects because if beneficials have no food, they move to another location. Minimize the use of pesticides that can kill beneficial insects as well as pests.

But how does one encourage beneficials? We can take a hint from farmers, who are starting to line their rows with "flowering hedgerows" of beneficial-attracting plants. Read all about it at "Improving Pest Management and Pollination with Farmscaping," VA.Coop.Ext./pub.PDF. The number and variety of attractor-plants was quite the eye-opener, and I encourage you to take a look at the **Organic IPM Field Guide**, which is a photo-based downloadable PDF on the **ATTRA Sustainable Agriculture** website: https://attra.ncat.org/product/organic-ipm-field-guide/. You'll need to scroll to page 3. Here are a few of the things I learned while doing my research:

- Ladybugs (both larvae and adults) are predators of aphids, mealy bugs, mites, and soft scale, as well as of the eggs of insect pests. I was surprised to read that ladybugs are attracted to members of the carrot family — fennel, dill, and Queen Anne's lace.

*Ladybug larva eating aphids. Photo: Mark Yokoyama, CC by NC-ND-2.0, NC Stat*pests.

- The Tachinid fly *Trichopode pennipes* is a parasite of squash bugs. Although parasitism rates as

high as 80 percent have been reported, the fly is still unable to control squash bug populations below economically damaging levels on farms. For the home gardener, however, encouraging this beneficial can be a useful tactic, especially when combined with physical strategies like picking off the bugs or trapping them under boards.

I barely scratched the surface, though, but I'm determined to increase my knowledge base about beneficial insects. By the way, some beneficials can be purchased, but you have to know enough to choose the correct beneficial for your pest, as well as the proper time for release when the pest is present. In some cases, these releases are a short-term solution, often requiring a repeat release each season.

Other biological tactics include **pathogens and beneficial nematodes,** which can be tricky to manage and more often used by farmers. Read more about these methods and their limitations at NC State Extension Gardener Handbook/ IPM / Biological Management. These products are becoming more user-friendly, however, so don't rule them out if they're the recommended option for a serious pest problem.

Chemicals

- **Biorationals or Biopesticides** are derived from plants, so they do not present the toxicity problems of conventional synthetic chemicals. You can read more about these in a recent Garden Shed article, Biopesticides/The Garden Shed To determine if there's a biopesticide for your particular pest, look at the charts in the Va. Tech Pest Management Guide.
- **Synthetic or Conventional Pesticides** Most of us gardeners want to avoid this section of the pyramid, though it may be unavoidable in some cases. But if you've carefully applied the IPM process in reaching this conclusion, you'll at least feel a bit better about it.

As part of your decision-making process, do not forget to consult the Va.Tech **Pest Management Guide**, which I mentioned previously. **Table 2.1** identifies organic methods — including biopesticides — for control of many vegetable pests. **Chapter 2-6** contains charts for many vegetable pests with helpful photographs, plus the recommended cultural, mechanical, and biological controls, including beneficial insects that are their natural enemies. 2020 Pest Management Guide /pubs456/456-018/ENTO-336.pdf. For similar information about pests of ornamentals, you can consult **Table 4.5** identifying "Control Measures for Major Pests and Pest Groups" which lists known biological, mechanical and cultural controls along with the recommended pesticides for insects of trees, shrubs, annuals, and perennials.

Want to follow along the steps of the IPM process with respect to one particular pest? Here you go: NC State Ext./Gardeners Handbook/ IPM / Case Study will allow you to do just that with a homeowner whose juniper tree is looking sickly and chewed.

3. Try the Strategy & Monitor the Results

After you've executed your chosen first strategy, monitor the pest population. Does it seem to be reduced? Are the affected plants looking better? If not, you may decide to move up the pyramid and try another strategy. A combination of strategies my be just the ticket. Or perhaps you'll decide that you can live with the degree of damage your plant or crop is experiencing.

Using IPM means keeping the big picture in mind. Our goal as gardeners is to have a healthy landscape that works with nature and requires few inputs, and this means that it will have a variety of beneficial insects and a tolerable level of damaging pests.

SOURCES:

Integrated Pest Management for Vegetable Gardens/ Va.Coop.Ext.

Insect Identification Lab/Va.Coop.Ext.

"What About IPM?" Va.Tech Pesticide Programs

Video: Integrated Pest Management IPM Basics/ Univ. of Maryland

2020 Pest Management Guide/Va.Coop.Ext/pubs456/456-018/ENTO-336.pdf.

Resources for Garden Insect Pests, Va.Coop.Ext.

"Balancing Nature Within Your Landscape," Clemson.edu

"Integrated Pest Management," North Carolina Extension Gardener Handbook/.ncsu.edu_IPM5179

"Insect and Related Pests of Shrubs," https://content.ces.ncsu.edu/insect-and-related-pests-of-shrubs

Featured Photo: *Rhinocapsus vanduzeei* on mountain laurel by Beatriz Moisset, CC-BY-SA-4.0, wikimedia commons

A Potential Insect Pest of Azaleas, Journal American Rhododendron Society (A. G. Wheeler, Jr. and Jon L. Herring)

Edible Gardening in May

By Ralph Morini | May 2020-Vol 6 No. 5

May is here and after a warm winter and early spring, it is time to get summer vegetables in the ground. We have noted in recent months that the VA Cooperative Extension has altered the final spring frost dates to April 15-25. VA.Hardiness Zone Map/Pub. 426-331. If the weather sites I have checked are correct, we haven't had a frost since early March. The warming trend seems undeniable. On the positive side it means a longer growing season. On the flip side it can mean more serious pest problems. In any case, let's finish up our early season planting.

Early planters may already be harvesting radishes, peas and a variety of greens. Good for you. Planting cool weather vegetables now requires looking at days to maturity. No sense starting crops now that won't tolerate the warmer weather of summer. We are at or near the end of planting time for beets, carrots, broccoli, cabbage, onions and many greens.

However now is the time to **plant summer vegetables**. These include beans, corn, cucumbers, eggplants, melons, squash sweet potatoes and pepper and tomato transplants.

For a detailed **list of recommended planting times** for vegetables in Hardiness Zones 6 and 7, check out Extension Publication 426-331, Vegetable planting Guide and Recommended Planting Dates.

Other tips for May vegetable gardening in our area include:

Tomato transplants are ready to be placed in the garden when they have 5-7 leaves. When transplanting tomatoes, place 2/3 of the plant below the soil surface. Pull leaves off the bottom two-thirds of the plants and either dig the planting hole deep enough to stand the plant up or lay the underground stem section on its side. Tomatoes will add roots underground and build a stronger root system if planted this way. When **choosing your tomato varieties** consider determinate types that ripen within a narrow time period if you are a canner and want a single harvest. Indeterminate varieties will provide a steady supply of ripening fruits until frost if well cared for.

Eggplants like 80 to 90 degree temperatures and plenty of water. Best to water them thoroughly twice a week during dry periods.

Speaking of moisture, **beans, peas and other legumes** that fix soil nitrogen produce fewer, smaller nodules when water stressed. It is also important to keep them well-watered.

Extend your harvest season by planting sweet corn and beans every two weeks through the end of June. An alternative with corn is to plant early, mid and late maturing varieties at the same time.

Missing corn kernels on your corn ears? This may be the result of **poor pollination**. Sweet corn is wind-pollinated. Pollen from the corn flower has to reach every strand of silk on each growing ear to develop fully-

kernelled mature corn ears. **Block planting in short rows** (3-4 rows or more) will pollinate more successfully than 1 or 2 long rows. For more information on growing sweet corn, take a look at Virginia Cooperative Extension Publication 426-405

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 them, 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.

Guidance on fertilization is available at Extension Publication 426-323, “Fertilizing the Vegetable Garden.” In a few pages it offers a nice summary of plant nutrition requirements and fertilizing options. I like to use mainly organic amendments with a small application of synthetic fertilizer at planting to provide a quick NPK injection to the plant while giving soil life a chance to make the organic nutrients plant available.

Where should I water?

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 save time looking for the main root, but you'll save water as well.

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.

If you are growing cole crops including cabbage, broccoli, cauliflower, kale, collards or other greens, May will likely bring a variety of cabbage worms that can decimate your crop. Options for control include hand-picking, using an organic pesticide like Bt (Bacillus Thuringiensis), or row covers. I have also had luck hanging decoys of cabbage moths above that area of the garden. The decoys appear to discourage territorial moths from laying their eggs in that location. For more information check out Garden Shed Articles "OMG What's Eating the Broccoli" and "Row Covers: a Gardening Season Extender with Benefits". If you choose to try the non-chemical row cover technique, act quickly to get them in place before the cabbage moths arrive.

To preserve leftover seeds, store them in a sealed container and refrigerate them, with a dessicant, such as a few layers of paper towels with 2 tablespoons of powdered milk folded up inside them.

This is also a great time to **start a fresh batch of compost**. Grass clippings and kitchen scraps become available as we begin mowing lawns and eating seasonal fruits and vegetables. If you've saved some leaves from last fall, you have what you need to create a good compost batch that will be ready for use this fall. Refer to Garden Shed article "Backyard Composting with Practical Tips from the Pros" for more details on composting.

During this time of social distancing and quarantining, gardening can be a comforting activity. In addition, picking your own vegetables relieves the stress of managing potential contamination of purchased produce. Good luck with the garden and stay safe. Thanks for checking in. See you next month.

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

VA Cooperative Extension: May Tips: Vegetables
https://albemarle.ext.vt.edu/content/dam/albemarle_ext_vt_edu/files/hort-tip-sheets/5-14-veg.pdf

Photos:

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Radishes: "First radishes May 12, 2015" by livewombat is licensed under CC BY-NC-SA 2.0

Where should I water? "DSCN4028" by skrubtudse is licensed under CC BY-NC-SA 2.0