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Managing Crape Myrtle Bark Scale

By Cathy Caldwell | November 2024-Vol.10,No.11



Crape Myrtle Bark Scale (CMBS) is an invasive felt scale insect that primarily affects Crape Myrtle trees. After first appearing in Texas in 2004, this insect is now relatively common throughout the southeastern U.S., and, more pointedly, in Central Virginia. In recent years, the PMG Horticultural Helpdesk has received inquiries regarding CMBS and what to do about it. This article examines the biology, impact, and management of CMBS and shares some practical advice on how to mitigate it, based on my own experience dealing with a CMBS infestation over an 18-month span.

How Do You Know When You Have CMBS?

CMBS is a soft scale insect that feeds on the sap of Crape Myrtle trees. Adult females have a white, waxy coating, making them appear like small cotton-like lumps on the branches and trunks of infested trees. Once a tree becomes infested, sooty mold growth appears on the bark due to a sugar-rich sticky liquid excreted by the insects. Along with sooty mold growth, the presence of ants on infested trees can be a telltale sign of CMBS as they scavenge the sugar-rich sticky liquid given off by the insects. Other symptoms of an infestation include yellowing leaves, reduced flowering, and overall tree decline.

One simple way to identify whether you have CMBS is to use your fingernail to scratch the white cotton-like lumps on an infested tree. If



Cotton-like lumps of Crape Myrtle Bark Scale on trunk. Photo: Geoff LeBlond

you see a red, blood-like liquid just below the cottony surface, there's a good chance it's CMBS. If you're still not certain, consider these steps:

- Reach out to the PMG Horticultural Helpdesk and share a photo of an infested tree. This is often the quickest way to get help identifying CMBS.
- Work with the Helpdesk to submit a sample for identification at the Virginia Tech labs. Although this method takes a little longer, it is the best way to receive a definitive diagnosis.



How Does CMBS Spread?

There are numerous ways that CMBS can spread. Here are some of the most common:

- *Human transport*: When infested plants are moved, the scale can spread to new areas. Be sure to carefully inspect prospective Crape Myrtles in the plant nursery or garden center, before making a purchase.
- *Wind*: Wind can blow crawlers, the mobile stage of the scale, to new plants.
- *Birds and insects*: Crawlers can be transported on birds and pollinators.

In my case, frost damage to one backyard Crape Myrtle in the early spring of 2023 made the tree especially susceptible to CMBS infestation. From there, the disease spread quickly to six other nearby Crape Myrtles in a backyard stand. Soon all were showing signs of cotton-like lumps and various amounts of sooty mold growth. Fortunately, none of the other trees were nearly as adversely affected as the first, making mitigation slightly easier for them.

Impact on Crape Myrtles

The impact of CMBS on Crape Myrtles can be severe. As sap-sucking insects, the scales weaken the trees by extracting essential nutrients, leading to stress and increased susceptibility to disease and environmental stress. Infected trees typically exhibit stunted growth, leaf drop, and diminished flowering.

As I discovered firsthand, the need for increased pest management practices, including chemical or biological treatment and consistent monitoring necessitated a significant commitment of time and resources to overcome the infestation.

Management Strategies

Managing Crape Myrtle Bark Scale effectively requires an integrated approach. University studies emphasize the importance of early detection and monitoring. Regular inspections during the growing season can help identify infestations before they become severe. If you're like me, though, and fail to address the problem in its early stages, CMBS is likely to have a significant impact in a matter of a few weeks.

If you're seeing a CMBS infestation and have grown concerned that it may spread to other Crape Myrtle trees in your yard or neighborhood, it may be best to remove the infested trees entirely, placing them in plastic bags, and disposing of the bags properly in the trash. Alternatively, if there are relatively few neighboring Crape Myrtle trees and you're committed to saving your trees by managing the infestation, there are some steps you can take.

To begin with, **cultural practices play a vital role** in the management of CMBS. Maintaining tree health through proper watering, fertilization, and pruning can enhance resilience against pests. Additionally, reducing humidity around the trees can help minimize conditions favorable for the scale's growth. For this reason, it is best to plant Crape Myrtle trees in full sun if possible.

When chemical control is necessary, research indicates that systemic insecticides can be effective. Soil-applied insecticides are the most effective treatments currently available for CMBS and the easiest to apply. These insecticides contain active ingredients such as imidacloprid, imidacloprid + clothianidin, dinotefuran, and thiamethoxam. These insecticides are absorbed by the plant and provide long-lasting protection against CMBS and other scale insects. This was the approach I used after experiencing an extensive CMBS

infestation in the spring of 2023. Applying a combination insecticide and fertilizer via soil-drench in the late fall of 2023 and 2024 has yielded positive results in my case. Note that if you choose this route, it is critical to read the instructions on the product label and follow them closely. If you have any doubts about working with insecticides, consider contacting a certified arborist who has experience and equipment necessary to mitigate CMBS.

Caution: The active ingredients in the insecticides mentioned above, including imidacloprid, are known as “neonics,” which have a deleterious impact on pollinators. Details can be found in this Garden Shed article by Ralph Morini: [Another Pesticide Controversy: Neonicotinoids and Pollinator Decline](#). Since neonics are lethal to pollinators, you should never apply them when pollinators or predatory ladybird beetle adults or larvae are present. What’s more, as stated in the article [Crape-myrtle Bark Scale](#) by the Henrico County Virginia Cooperative Extension, “Avoid applying any foliar insecticide when Crape Myrtles are blooming. Drenching at the base of the tree will be a safer approach to bees and other non-target organisms, when compared to a foliar application.”

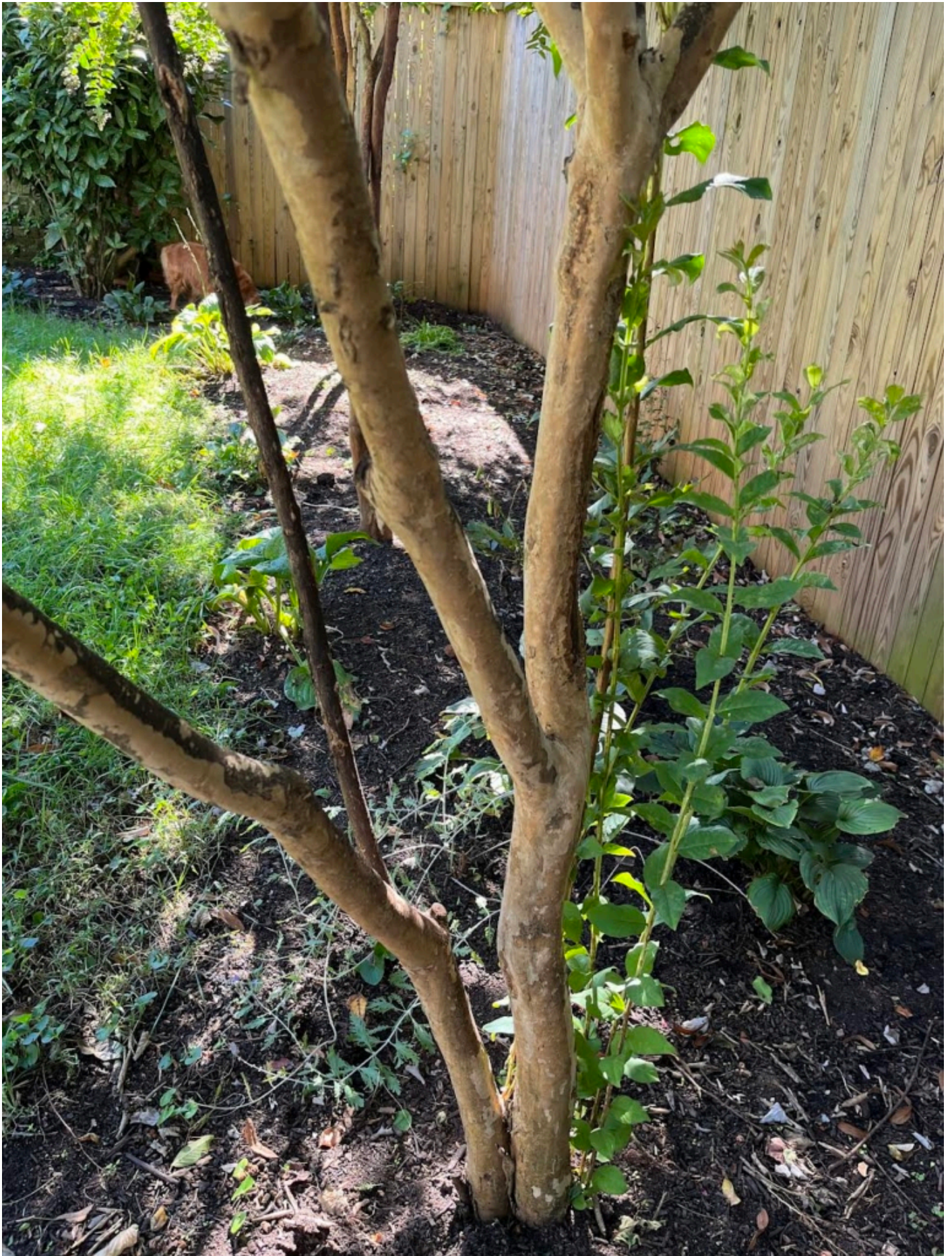
Biological control measures are also being explored, with some studies highlighting the potential of natural predators, like lady beetles and parasitoids, to help manage scale insects. While these methods may not eliminate CMBS, they can help keep populations at manageable levels.

The Road to Recovery

The road to recovery from CMBS can be a long one, requiring diligent effort over the course of months. But mitigation is possible.

The photos below show the results of my 18-month effort to mitigate CMBS in a cluster of seven infested backyard trees. After applying the mitigation strategies described above in the fall of 2023 and 2024, none of the trees are currently showing any signs of white cotton-like lumps or sooty mold. Further, the ants that were so prevalent during the height of the infestation are no longer present. As the photos below show, the original, most heavily infested tree is a bit stunted from its heavy bout with CMBS, but numerous signs of new growth are now evident. Although this tree may never catch up to the height and fullness of its neighbors, it remains an esteemed member of our backyard garden.





In general, by employing an integrated pest management approach that includes monitoring, cultural practices, and appropriate use of chemical or biological controls, it is possible to mitigate the effects of CMBS and protect these popular and cherished ornamental trees.

SOURCES:

- [Crape-myrtle Bark Scale](#), Virginia Cooperative Extension, Henrico County.
- [Another Pesticide Controversy: Neonicotinoids and Pollinator Decline](#), Ralph Morini, May 2019-Vol.5 No.5 of the Garden Shed.
- [Crape Myrtle Bark Scale](#), Clemson Cooperative Extension, Joey Williamson, PhD, HGIC Horticulture Extension Agent, Clemson University. Updated: Sep 13, 2024.
- [Crapemyrtle Bark Scale in Home Gardens](#), University of Maryland Extension. (Updated: Sep 24, 2024).

PMG Landscaping Partnership With Habitat for Humanity of Greater Charlottesville

By Ralph Morini | November 2024-Vol.10,No.11



During 2020, the Piedmont Master Gardeners (PMG) formed a committee to review the organization's work and update its direction through 2025. The resulting Strategic Plan emphasized maintaining our historical priorities and projects while increasing emphasis in several areas including:

- Increased focus on environmental stewardship and sustainability
- Diversifying our membership and community client breadth
- Forming community partnerships with like-minded local organizations.

The result was several new projects where we partnered with multiple community groups. One example, **Schoolyard Garden Projects**, was featured in the September issue of The Garden Shed. It presented our inspiring work at three Albemarle County elementary schools. This article focuses on another community project, the PMG landscaping partnership with Habitat for Humanity of Greater Charlottesville (Habitat). Habitat is another community group with whom we were able to establish common goals of science-based sustainable horticulture education, diversifying partners and clients while connecting with like-minded

community organizations.

Forming the Partnership

After strategic plan approval, we identified Habitat as a potential partner. It turned out to be a positive connection for both sides. Habitat's main function is helping low-income families improve their living conditions through home ownership when they commit to training, work hours and regular mortgage payments. Their focus is on home construction and preparing member families for success as homeowners and community members. Landscaping the homes and training new occupants in maintaining their landscapes was not previously a priority. Both Habitat leadership and PMG investigators quickly agreed that PMG could help improve the horticultural education as well as the landscape quality and appearance for new Habitat homeowners. A partnership quickly formed.

The initial agreement was that PMG would work with Habitat and Habitat families to design front landscape gardens, select plants which Habitat would purchase and transport to housing sites, and work with families, Habitat workers and volunteers to do the planting. It included providing training on care and maintenance to assist families in maintaining the appearance and value of their properties. PMG also committed to making a modest contribution to the landscaping costs for each home. The first landscaping was done in 2021.

The First Two Years

During 2021, Habitat completed, and PMG helped landscape 4 homes located in Charlottesville and Albemarle County as far south as Esmont. They included two single family homes (see one in the lead photo) and a duplex. Where in the past, homes were landscaped with traditional shrubs, PMG was able to convert shrub and perennial choices to predominantly native plants, while providing space for favorite non-natives when families expressed such a desire. We educated planters and improved practices to include adding compost to plantings to help improve the compacted clay soils at all the homes. Also, adding mulch to the finished beds became a standard practice, and the weed reduction and moisture maintenance benefits were communicated to the homeowner families.

One of the difficulties we encountered, was making deep connections with many of the homeowners. Most were single parent families with demanding work and child support responsibilities. We dealt with that by creating written handouts that include materials to explain best planting practices, benefits of native plants, soil amendments and mulching benefits as well as ongoing care and maintenance needs.



MGs planting new duplex with Habitat family children. Photo: Habitat

In 2022, the project grew to landscape 12 homes, including a single family, multiple duplexes and a triplex. Project basics didn't change, but many of the homes were located in mixed income communities - neighborhoods that were a mix of Habitat and commercial homes. This helped families see the value in our training as they included landscaping and curb appeal in their home management efforts. We were able to include children to a greater degree, and provided flowers, soil and pots for planting that they learned from and enjoyed.

During the year, we identified a couple of issues that we communicated to Habitat, requesting inclusion in their building process. Watering is a critical element of maintaining healthy landscapes, but providing exterior spigots for watering wasn't a regular element of Habitat's home design. After discussion of the need and benefits, the construction group began including outside faucets in all homes.

Also, gutter downspouts were often releasing rainwater straight onto the ground, causing erosion and in some cases, water buildup against the buildings. Again, discussions led quickly to improvement in practices and consideration of the environmental effects of sometimes overlooked landscaping elements.

Landscaping at the Southwood Development

In 2023 Habitat's focus turned to a long-term, high-volume project in the Southwood development. In the works since their purchase of the property in 2007, the plan is to convert an aging trailer park into a development that includes about half market-based homes built by commercial builders and half affordable homes by Habitat or rentals by the Piedmont Housing Alliance. It is a huge undertaking that includes over 300 families in the trailer park, all of whom can be included in Habitat homes by committing to Habitat's training, work and financial responsibility requirements. The plan includes 11 small villages to be constructed over more than a decade. In 2023, the first year of high-volume construction and move-ins, we worked in Village 1.

The landscaping plan changed to the extent that the community is a designed development with more

regulations and detailed planning than the prior homes. A commercial landscape firm designed the basic neighborhood landscape layout, including street plant selection, while Habitat hired a landscape professional to design the garden beds and select the plants to be included at each home.

PMG worked with the Habitat designer to influence plant selection aiming for a roughly 70% native plant mix. Our job was simplified as Habitat delivered the plants to each site and placed them in their approximate location in the beds. The Master Gardener role included working with Habitat to finalize plant location, guiding families and volunteers in planting them and providing verbal and written information, in Spanish and English, that covered everything from planting to longer term care, to help families maintain a healthy and attractive landscape.



Landscaping in Village 1. Photo: Habitat



MGs, Habitat, Families and Volunteers. Photo: Habitat

We were involved in landscaping 24 homes between April and October, a big jump. Family involvement increased and the predominantly Hispanic family makeup included some experienced gardener/landscapers which was great. Habitat also provided more volunteer support to assist with the higher number of homes to be planted and provided Spanish language assistance as needed. This allowed us to expand our education element to include volunteers, many of whom came from UVA student volunteer groups.



Garden tool kit in new home. Photo: Habitat

Early in the year, we recognized that most families lacked the tools needed to provide appropriate plant care. We addressed this by providing each family a tool kit that included a trowel, weeding tool, pruner, hose, watering wand, gloves and a storage bucket. Although our Grant Committee won us grants from VCE and Bama Works to pay for the materials, our local Lowe’s offered to provide it all at their expense, making this their “Hero Project” for 2023. The Lowe’s name on the bucket communicated their participation to the homeowners. The kits were included as welcome gifts awaiting families at move-in.

Staying Involved in 2024

This year, Habitat’s construction group, along with Southwood’s commercial builders, began construction in neighboring Village 2. While the first new Habitat homes weren’t ready for landscaping until October, we participated in three Village 1 neighborhood events, that enabled us to maintain contact with families and work with them to enhance the sense of community.



MGs and family members at Village 1 block party. Photo: Habitat



Family member Aranza C. Planting with MG Melissa King. Photo: Habitat

In April we hosted a gardening table at the Village 1 Block Party. It included planting demonstrations for potted flowers, vegetables and herbs, as well as some annual flowers for kids to pot. It was a nice event that included several community organizations and a food truck. It was fun to meet folks in a more relaxed

context than landscape planting day, while mixing with other exhibitors and community members.

In late May, we participated in Southwood Market Day. Several PMG volunteers worked to promote native plants and their environmental benefits while helping neighborhood children plant seeds in pots that they could take home to grow.



MGs and Residents of Village 1 Planting Pocket Park. Photo: R Morini



Village 1 Pocket Park 4 months after planting. Photo: R Morini

In June, we assisted Habitat and a mix of Village 1 residents, both Habitat and independent families, in landscaping a corner of the neighborhood that they converted into a “Pocket Park”. The intention is to provide a pleasant place for neighborhood gatherings. It was a nice way to meet some non-Habitat families and participate in a positive community event.

Separately, working with Habitat’s landscape designer, we prepared a brief document that summarizes the benefits of replacing non-native with native landscape plants. She passed it on to the commercial builders working in Southwood who have been using non-natives in their new homes. No commitments yet, but we are hopeful that they will show some interest in making their plant selections more sustainable.



Volunteers landscaping 8 townhomes. Photo: M Costanzo



Proud family cleaning up after planting. Photo: R Morini

Where we go from here

We wrapped up 2024 by landscaping 8 townhomes in October. The event included an education session and lunch supplied by Habitat. This increased the number of homes landscaped since 2021 to over 50 and has enabled PMG to spread the word on science-based horticulture, including the importance of native plants, to Habitat, homeowner families and volunteers, many of whom had little prior horticultural knowledge. We have built a strong relationship and helped improve the environmentally related practices of an important local organization that helps hard working lower income families improve their living situations. Working with Habitat personnel, homeowner families and volunteers has also helped us reach our diversity goals.

Everyone we have worked with, including Master Gardeners, Habitat personnel, families and volunteers, has expressed appreciation for their role in this positive project. The project and the relationships that have developed leave those who have played a part feeling a sense of pride in their contribution. Since its beginning, our local Habitat has placed over 300 families in homes and only 8 have defaulted on their mortgage, an impressive success rate. In each case, Habitat was able to re-acquire the homes and sell them to other Habitat families, maintaining them as affordable housing. Bringing people together to build homes and communities and helping families to help themselves is Habitat's foundational mission. Their record speaks for itself. PMG is proud to bring our skills to support this work and we look forward to continuing our mutual relationship as Habitat expands the Southwood and subsequent developments, for years to come.

November in the Ornamental Garden

By Cathy Caldwell | November 2024-Vol.10,No.11



With the arrival of November, all signs point to the end of the growing season and the beginning of winter dormancy in the ornamental garden. On warmer days, bees, flies, beetles, and other insects continue to visit the few remaining flowers in search of sustenance. Take advantage of those milder days to finish preparing the garden for cold weather ahead.

IS IT TOO LATE TO PLANT TREES AND SHRUBS?

Perennials should be planted at least 6 to 8 weeks before the ground freezes so that they have time to develop good strong root systems before the onset of cold weather. Other plants, such as the following, may be planted right up until the ground freezes:

- **Continue planting deciduous trees and shrubs** until the ground freezes. As the weather turns chilly and you dread working outside, it may be tempting to cut corners on installing new trees and shrubs. Most failed plantings occur because the tree or shrub was planted too deeply or the root ball was not properly watered. Ideally, the hole should be no deeper than the depth of the root ball. Until the ground freezes, the root ball and surrounding soil should be watered

slowly and deeply to keep it from drying out. For additional advice, see the Virginia Cooperative Extension's (VCE) guidelines for [planting trees](#). If recent droughts, excessive heat, and deer browse have you wondering just what kind of tree to plant, you'll find a very helpful chart at this [new publication from Virginia Tech](#). Although its title suggests it is solely concerned with choosing trees to avoid problems with overhead utility lines, it provides much broader guidance than that.

- **Plant tulip bulbs** in a prepared sunny, well-drained site once the soil cools to about 55°F and night-time temperatures range between 40° and 50°. Tulips require cool soil so that they don't send up shoots before the roots are established. They may be planted up until the soil freezes. Plant them deeply (about three times the diameter of the bulb) to help protect them from frost heaving as well as from mice, voles and squirrels. Cover the planted area with a layer of mulch about three inches deep. TIP: If you have a deer problem, make a note to protect your tulips from deer browsing once the foliage starts to emerge next spring. Either use a physical barrier or a deer repellent.

THERE'S STILL TIME TO WRAP UP THESE TASKS BEFORE WINTER

If you're a procrastinator or just a very busy person, you may still be working on putting your garden to bed for the winter. Here's a suggested list of tasks to tackle before winter:

- **Dig up and store tender bulbs** that you didn't get around to digging up in October. University of Maryland Publication HG105 on [Overwintering Tropical Plants](#) provides good advice on how to store caladium and elephant ear (*Colocasia spp.*) bulbs. It also provides guidance on how to overwinter tropical plants in general.
- **Finish preparing ponds and water features for winter.** Use a pond net to scoop fallen leaves from the water. Prune dead stems and leaves from aquatic plants to prevent the debris from decaying in the water over the winter.
- **Drain garden hoses before the onset of cold weather** to help prolong the life of the hoses. Wipe off dirt and other debris, roll up the hoses, and store them in a shed, garage, basement or other protected place out of the weather.
- **Remove, clean, dry, and store garden stakes, portable trellises, and all breakable items,** including terra cotta pots, rain gauges, bird baths and garden art, that might be damaged by winter weather.
- **Inspect all containers of pesticides, fungicides, and herbicides** to make sure they are well sealed. Store them in a frost-free area to protect them from freezing temperatures.
- **Inspect lawn mowers, tillers, or other gardening equipment for any needed servicing** and plan to have the service completed now or over the winter months.
- **If you have a greenhouse, now is the time to do some basic clean up and maintenance.** Clean the windows thoroughly so that the maximum amount of sunlight can penetrate to your plants. Replace any broken or cracked windows. Check all opening panels to make sure they are in good working order. Grease the hinges if needed. If you rely on a heater to keep temperatures above freezing, make sure it is in working order.
- **Inspect garden tools** before storing them for the winter. Remove dirt and grime from metal surfaces to prevent the formation of rust. Sharpen any tools that have grown dull from use. Treat wooden handles with a mixture of two parts boiled linseed oil to one part paint thinner or turpentine to prevent the wood from cracking. Finally, organize tools so that they can be easily found next spring.
- **Cut back the stems and foliage of established chrysanthemums** about three inches above the ground now or, if you prefer, wait until late winter or early spring to cut them back. If the chrysanthemums were planted this fall, they may survive cold weather better if the stems are

left in place. The dead foliage will help protect the plant crown during winter. Also make sure the mums are well watered going into winter.

- **Leave tall sedum standing** over the winter months. The dried brownish-looking seed heads add plenty of color and texture to the garden in fall and winter. They're also stunning when covered in frost or ice.
- **Manage fallen leaves on turf and in flower beds.** A thick layer of leaves on turf can block sunlight from reaching grass. They can also trap and hold moisture beneath them, which can set the stage for turf disease. If you have a mulching lawn mower, use it to shred leaves so that the smaller bits and pieces can more quickly decompose and nourish the soil without harming the turf. See VCE publication [430-521](#), "Leave Them Alone - Lawn Leaf Management," for more information on mulching leaves. An alternative to mulching the leaves is to collect them and add them to a compost pile. See VCE publication [426-703](#), "Making Compost from Yard Waste," for more information on composting. As a third option, consider leaving fallen leaves in place in landscaped areas such as under shrubs or trees where they can decompose slowly without harming the plants. The reason for doing this is to help protect the eggs or larvae of butterflies, moths, and other beneficial insects until they can emerge in spring.
- **Don't get overly aggressive about cleaning up your spent ornamentals.** A little mess is actually not a bad thing. For example, plants with seed heads are a critical source of food for foraging birds over winter. Seeds from cone flower, aster species, black-eyed Susan, sedum, Joe Pye weed, coreopsis, globe thistle, and even zinnias and marigolds will be welcomed by a variety of bird species. Just focus on cleaning up stems and leaves from plants such as peonies and garden phlox, which are subject to fungal diseases, or irises, which are subject to borer infestations.
- **Fertilize dormant trees and shrubs** with a slow-release organic fertilizer so that nutrients will be available to the plants in early spring. See VCE publication [430-018](#), "Fertilizing Landscape Trees and Shrubs," for information on fertilization basics, such as the signs of plant stress and diminished vigor, types of fertilizers, when to apply fertilizer, and how much. When you apply fertilizer, water it into the soil. Otherwise, the plants cannot absorb the nutrients.
- **Collect soil samples** to test for pH and nutritional levels. Don't guess what your soil needs. If the soil test indicates your soil pH needs to be raised or lowered, now is a good time to apply either lime or sulfur as needed. For more information, see VCE Publication [452-129](#), "Soil Sampling for the Home Gardener."

DON'T FORGET TO PROTECT YOUR PLANTINGS FROM WILDLIFE DAMAGE

The garden may be going dormant now but that doesn't mean you can stop monitoring it for signs of wildlife damage.

Protect young trees from deer damage, which can result from male deer rubbing and scraping their antlers against tree trunks to remove the “velvet” that has been growing all summer. Rubbing is also the way a deer marks its territory and intimidates other male deer. Protect the tree trunk and lower stems with a physical barrier such as a fence, a wire mesh trunk guard, or a plastic tube or pipe. Another strategy is to loosely wrap chicken wire around the trunk. Regardless of the method used, make sure the barrier does not rub against the bark or restrict the trunk from expanding as it grows.



Acer griseum (Paperbark maple) with deer protection. Photo: Gail and Hal Clark

- **Protect dormant trees from mouse and vole damage** over the winter months. Contrary to what some people think, these diminutive creatures don't hibernate. In fact, they can do some of their worst damage over the winter months. Voles, for example, can do extensive damage to the roots and bark of many woody plants. Several strategies can help mitigate the damage they cause. Install a physical barrier of hardware cloth or wire mesh trunk guards at the base of vulnerable young trees. Wait until after the first hard frost to apply mulch at the base of trees and shrubs but not touching the trunks. If you were using vole and mole repellents over the summer months, don't stop just because the weather has turned cold.

HOUSEPLANT CARE

Now that houseplants are fully acclimated to the indoors after their vacation outside this summer, focus on keeping them healthy and happy within your home's warmer, drier conditions. To learn more about the general care and feeding of houseplants, see VCE Publication [426-100](#), "Indoor Plant Culture."

- **Reduce or hold off on fertilizing houseplants until spring.** Fertilizer requirements vary from plant to plant depending on their growth rate and the type of fertilizer being applied. In general, they require little or no fertilizer after they have been brought indoors for the winter because this is their time to rest.
- **Cut back on watering but do monitor moisture and humidity levels.** The biggest mistake many people make with houseplants is overwatering them. With the exception of ferns, which generally prefer evenly moist soil, allow the soil of other houseplants to dry between waterings. Meanwhile, most houseplants prefer relative humidity levels of about 40% to 50% and benefit from being misted two or three times a week. Another way to increase humidity is to place the plants on a tray of moist pebbles. Brown tips on the ends of leaves usually indicate that the humidity is too low.
- **Make sure light levels are adequate** for the needs of each houseplant. Give each plant a quarter turn weekly to prevent the plant from leaning toward the light.
- **Provide plenty of bright light to overwintered tropical plants** such as mandevilla, fuchsia, or hibiscus to encourage blooms indoors. Water the plant when the top inch or two of soil

becomes dry and mist the foliage periodically to raise the humidity level. If the plant is too large to overwinter indoors, it may be maintained in a semi-dormant state in a frost-free garage or basement. If you choose this storage method, water the plant sparingly so that the root ball does not dry out.

- **Pot hardy spring bulbs for indoor forcing.** For advice on how to force bulbs into bloom, see VCE Publication [HORT-76](#), Fooling Mother Nature: Forcing Flower Bulbs for Indoor Bloom.
- **Start forcing paper white Narcissus bulbs** now in order to have them in bloom over the winter holidays. Paper whites don't require any period of chilling and are very easy to force. Once planted, they will bloom in about 5 to 6 weeks, according to VCE Publication [HORT-76 on forcing flower bulbs for indoor bloom](#). This publication provides excellent graphics and clear instructions on forcing bulbs. It also provides a useful listing of bulbs commonly forced into bloom and projections on the number of weeks they should be planted in advance of flowering.
- **Start Amaryllis bulbs** now for a spectacular in-door floral show over the winter months. One of the easiest and most satisfying of bulbs to force, these popular bulbs, like paper whites, don't need to be chilled in advance of forcing. They prefer to be planted in a pot that is only slightly larger than the bulb. So, select a pot that allows no more than one inch of space on each side of the bulb. If the pot is too big, the bulb may not bloom. Position the bulb so that the top third is above the soil line. Place the potted bulb on a sunny windowsill in a cool room (about 60 to 75° F). Water after potting. Afterwards, water only when the soil feels dry to the touch.

INVASIVE ALERT

Chinese Privet (*Ligustrum sinense*) is one of the most widely found invasive plants in the South, according to the Blue Ridge Partnership for Regional Invasive Species Management (PRISM). This evergreen to semi-evergreen shrub typically grows 10' to 15' tall but can reach 30'. Shallow, wide-spreading, suckering roots allow it to form large monotypic stands and impenetrable thickets that destroy wildlife habitat. Although Chinese privet and all other species of privet are invasive, they are still being sold in nurseries as hedges or privacy screens. White or off-white flowers bloom profusely in June; blue-black, berrylike fruits appear in August and last into winter. Although small seedlings can be removed manually, larger shrubs usually re-sprout, so consult the detailed [control guidance provided by the Blue Ridge PRISM](#), which discusses a variety of options that are effective at this time of year. For more information on [Chinese Privet](#), check out the YouTube video on the U.S. Department of Agriculture's National Invasive Species Information Center website, and for help in identifying it, the [collected photos at Invasive.org](#). To learn more about other invasive species in this area of Virginia and methods for controlling them, see the [Blue Ridge PRISM](#) website. See also the [Invasive Plant Control Calendar](#) in the May 2022 issue of *The Garden Shed*.



Chinese privet foliage. Photo: Richard Gardner, Bugwood.org, [CC BY-NC 3.0](#).

Upcoming Events

By Cathy Caldwell | November 2024-Vol.10,No.11

Fall Festival at the Botanical Garden of the Piedmont Saturday, November 2 @ 9:30 am - 1:30 pm

Schedule of Activities — Note: Schedule is subject to change*

9:30am-10:30am Bird Walk (Adults Only) Space is Limited to 12 Participants

9:30am-10:00am Taste of T'ai Chi (5 and Up) Space is Limited to 8 Participants

10:00am-1:00pm Explore to Read (All Ages)

10:00am-12:00pm Fairy House Booth - Bennett's Village (All Ages)

10:00am-10:30am Story and Stretch (Ages 3-7 suggested, but all are welcome)

10:15am-10:45am Taste of T'ai Chi (5 and Up) Space is Limited to 8 Participants

10:45am-11:15am Leaves for All (Ages 3-7 suggested, but all are welcome)

11:00am-12pm Garden Site Tour (All Ages) Space is Limited to 16 Participants

11:00am-12:30pm T'ai Chi Demonstration and Q&A (All Ages)

11:00am-12pm Invasive Species Workshop with PRISM (Adults Only)

12:30pm-1:30pm Yoga with Mindful Mountain Yoga Cville (Adults Only)

There will also be informational tables hosted by the Herpetological Society of Virginia, Virginia Museum of Natural History, Community Climate Collaborative, Bennett's Village, and Botanical Garden of the Piedmont.

=[Find out more and REGISTER HERE](#)

Garden Basics: Nature's Cornucopia of Holiday Plants and Decorations



Saturday, November 16, 2024 @ 2:00-4:00 pm

Welcome the winter holiday season with this festive workshop. Learn how to select, showcase, and maintain plants such as amaryllis, paperwhites, and Christmas cactus. Discover possibilities for decorating with materials collected in the yard or on the trail. Get inspired with examples using a variety of fragrant greens, cones, berries, dried flowers, and seed pods. You will create a simple take-home decoration.

Garden Basics is a partnership with the [Bread and Roses](#) ministry at Trinity Episcopal Church.

Space is limited. Registration closes at 5 pm November 15, 2024.

Free

=[Find out more & Register](#)

IDENTIFY AND CONTROL NON-NATIVE INVASIVE PLANTS IN FALL



Tree Steward Tim Maywalt will present this two-part class by Zoom. Managing the invasive plants that are overtaking our green spaces is a challenge. But any of us can do it with the knowledge to identify and treat them. Part 1 will show you how to identify about 30 common invasive plants in the Virginia Piedmont. Part 2 covers a wide range of options for treating them.

**Identify and Control Non-Native Invasive Plants in Fall-
*Introduction and Identification***

Part 1:

November 13 @ 7:00 pm - 8:30 pm

**Identify and Control Non-Native Invasive Plants in Fall -
*Methods***

Part 2: Control

November 14 @ 7:00 pm - 8:30 pm

=[Find out more and register here](#)

Invasives Watch

By Cathy Caldwell | November 2024-Vol.10,No.11



A number of invasive plants can be controlled effectively in late fall and early winter, as discussed in The Garden Shed's [Invasive Plant Control Calendar](#). The methods to be used include cut stump, hack and squirt, and basal bark. These methods may be employed at any time of the year except for early spring when the sap starts flowing upward to the leaves. For detailed guidance on how to use each of these methods, including types and amounts of herbicides to use, see [Controlling Invasive Plants Effectively & Safely with Herbicides/Blue Ridge PRISM](#).

Autumn Olive (*Elaeagnus umbellata*): According to the Blue Ridge PRISM, "Autumn olive can be controlled at any time of year, except during spring growth, by cut-stumping or hack & squirting."

Cut-Stump method: "Cut or saw all stems to several inches from the ground and immediately spray cuts with a concentrated recommended herbicide."

Hack & Squirt method: "Make hacks 2 inches apart in stem circumference and apply concentrated herbicide."

For a **video demonstrating how to use the cut stump method**, see [Controlling Autumn Olive/www.youtube.com](#). With either method, you do have to watch for re-sprouts, and if they appear, they must be treated again with herbicide. For more information, see [Autumn Olive/ Blue Ridge PRISM Factsheet](#). For help identifying autumn olive, see this [video/Invasive Autumn Olive/Piedmont Master Gardeners/YouTube shorts](#).

Asiatic or Oriental Bittersweet (*Celastrus orbiculatus*) is best treated with either cut stump or hack and squirt. Spraying large vines is not recommended.

Callery or Bradford Pear (*Pyrus calleryana* 'Bradford') can be treated from fall into early winter by using cut stump, hack and squirt, or basal bark methods.

Chinese Privet (*Ligustrum sinense*) is an evergreen to semi-evergreen shrub, growing 15-30' tall, that can form large stands and thickets. As indicated in the [Invasive Plant Control Calendar](#) article, "From November to January, after deciduous plants have dropped their leaves, cut larger privets down to a manageable size and apply a recommended foliar herbicide at a concentration higher than is needed to control most invasive plants. The cut stump method with an herbicide application to the cut, or a basal bark treatment are also effective methods and can be applied anytime except early spring."

Japanese Honeysuckle (*Lonicera japonica*) "is best treated with **foliar sprays from autumn to early winter** after most native plants have lost their leaves or are dormant, but **before a hard freeze (24°F)**. For the **cut stump method**, sever thick vines near the ground and **treat the cut ends with a recommended concentrated herbicide** from early summer into winter." [Invasive Plant Control Calendar](#).

Porcelain-Berry (*Ampelopsis brevipedunculata*) "From fall to winter, cut stump bigger vines and apply an herbicide immediately after. If you can reach the largest stems in the tangle, you can also use a basal bark application. Apply a concentrated, recommended herbicide mixed with horticultural oil to the lowest 12" of the stems; no cutting is needed. Be careful not to spray nearby desirable plants." [Invasive Plant Control Calendar](#).

PESTICIDE WARNING

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

SOURCES:

Featured Photo: Invasive vines killing shrubs and trees along a Charlottesville walking trail by Ralph Morini

Blue Ridge Partnership for Regional Invasive Species Management, [Blue Ridge PRISM](#)

[VA.DEPT. OF FORESTRY/Nonnative Invasive Plant Species Control Treatments: Timing, Methods and Herbicide Rates](#)

Piedmont Master Gardeners Invasives Videos, <https://www.youtube.com/@ThePiedmontMasterGardeners>

The Edible Garden in November

By Ralph Morini | November 2024-Vol.10,No.11



November has arrived and our outdoor planting season has ended. Gardeners who have planted fall crops are enjoying an extended harvest. Crops that can resist the cooler weather to varying degrees include beets, brassicas, carrots, greens, lettuce, spinach and leeks. Since the average first frost date for the Virginia Piedmont — in [hardiness zone 7b](#) — is October 25-November 5, frost is likely in November. To protect sensitive plants from frost damage, have row covers or other protective devices ready as needed, while keeping an eye on the extended forecast. It is time to clean up garden beds whose growing seasons are completed, protect soils for winter and take steps that will be of benefit next spring. Here are a few recommendations.

Cleaning and Protecting Beds

Beds that no longer have a growing crop should be cleaned. Remove plants and plant debris. It can be composted if clean, but if it shows evidence of disease or pest infestation, it should be bagged for disposal. It is late now to establish a cover crop, so covering soil with an organic mulch, like the straw in the lead photo, is the next best choice. Mulched leaves are a good and generally available option. Use the bagger on your mulching mower to collect chopped leaves, or mow and rake them. Use them as a mulch to protect soil or

mix them with grass clippings and kitchen scraps to start new compost batches. Chopping them up is important to allow water infiltration and reduce wind dispersal. They also break down faster than uncut leaves, providing needed organic matter for the soil while reducing carbon loss, erosion and moderating soil temperature. Other mulch options include straw, wood chips and aged non-pressure treated sawdust.

Cover Crops



Mixed winter cover crop at Cultivate Cville CATEC garden. Photo: R Morini

Best soil building practice today is keeping live roots in the soil, year-round. Cover crops are a recommended way to do this when other crops are not being grown. A diverse winter-hardy cover crop is a great soil builder. The photo above shows a crop that includes crimson clover, a legume that will add nitrogen, daikon radishes that will loosen compacted clay soil, annual rye grass for added root mass and vegetation. There is also some self-seeded buckwheat from the summer cover crop that will be winter killed but will add organic matter to the soil next spring so is a do-no-harm invader.

When cut, after flowering and before setting seed in the spring, the vegetative material can be tilled in as a green manure for new beds if you are still a tiller, composted or used to mulch transplants. The roots are left in the soil to decompose, where they are a good source of organic matter.

It is late to plant a cover crop now, but if you haven't done it, consider planting one next fall. More information on cover crops can be found in the article [Cover Crops](#) from the University of Maryland Extension.

Extending the Growing Season for Cool Weather Crops



DIY row cover. Photo: R Morini

Winter hardy crops, including many greens like lettuces, spinach, kale, collards and other brassicas planted in September or early October, should be harvestable now. Mulching around the plants will help reduce cooling and keep them productive into the winter. Using row covers maintains a temperature beneath the spun polyester fabric up to 5 or 6° F higher than ambient, while still allowing rainfall and sunlight to reach the plants. For more information on row cover options including a simple DIY system like the one in the photo, see the *Garden Shed* article [Row Covers: A Gardening Season Extender With Benefits](#).

Adding Compost

A couple of inches of clean compost, worked into the top 3 to 4 inches of soil, then covered with an organic mulch will improve next spring's soil readiness. Best practice is not to till deeply or turn the soil over, but to stir the compost into the soil surface, letting soil organisms decompose and carry the organic material deeper into the bed.

To habitual tillers, this seems counterintuitive. However, research and the experience of organic market farmers demonstrate that tilling destroys soil structure, reduces soil organism activity, releases stored carbon into the atmosphere and tends to compact after a few rains. Rotating crops through garden locations, using diverse cover crops, adding organic matter, and amending as soil tests indicate, are the best ways to improve and regenerate soils.

Start a New Compost Batch



Mulched leaf and grass compost batch. Photo: R Morini

With the abundance of fall leaves, start a new batch of compost that will be ready for next summer. Final lawn mowing and leaf removal generate a great mix of nitrogen and carbon-based organic materials to get decomposition started. Augment the nitrogen input it by mixing in kitchen fruit and vegetable scraps and coffee grounds during the winter. Microbial activity will slow down during the coldest winter weather, but with a little mixing to keep it aerated and good moisture management, it will be primed to take off as temps rise above 50° in early spring. The finer you chop the materials, the faster they will break down. Check out this [brochure on home composting](#) from the Penn State University Cooperative Extension for detailed guidance.

Prepare a New Bed



Straw covered sheet mulch bed at Cultivate Cville CATEC garden. Photo: R Morini

One circumstance where tilling soil may be useful is in starting a new bed. Loosening compacted soil and adding organic matter can be beneficial. However, sheet composting or lasagna mulching provides a non-dig alternative that may make sense. It involves scalping the grass off the bed area and covering it with a moistened layer of cardboard or multiple sheets of newspaper, then alternating layers of carbon and nitrogen rich materials. The layered material will cold compost over a few months, providing a carbon-rich surface that helps soil organisms flourish and carry organic matter deeper into the ground. Crops can be planted directly into the surface material. Starting the process now should provide you with a planting-ready bed for warm weather vegetables next spring. The photo above shows a sheet mulched plot using a paper barrier on the soil, covered with 6 inches of decomposed arborist waste and 3 inches of straw. For a detailed description of the process, refer to the Garden Shed article [Lasagna Mulching](#).

Other tips for the month include:

- Get your **garden documentation** in order. Knowing what you planted and where you planted it is important. Good crop rotation practice will help minimize disease and insect issues next year. Also, noting the crops and varieties that did and didn't do well provides guidance as you shop for seeds and plants for next year's garden.
- **Organize left over seeds** and store them in a cool dry place to maximize their germination success next year.
- **Root crops** such as carrots, radishes, turnips, and parsnips **store well outdoors** in the ground. Just before the ground freezes, bury these crops under a deep layer of leaves or straw.
- If you are a fruit grower, November is a good time to **mulch fruit trees**. Extend 2-3 inches of mulch to the edge of their canopy, while keeping it a few inches away from the trunk to prevent

potential rodent damage.

- **Early November is a good time to plant new fruit trees.** Mulch the same as for established trees.
- **Fallen fruits should be cleaned up** and buried or placed in the trash. Good sanitation practices will reduce insect and disease infestation next year.
- **Mulch strawberries** with straw or leaves. This should be done after several nights near 20°F but before the temperature drops into the teens. Apply the straw or leaves loosely but thick enough to hide plants from view.
- Get more tips for November tasks for fruit and nuts at [VCE's November Fruit and Nut Tips](#).
- **Now is a good time to collect soil samples** to test pH and nutrient levels. Organic amendments are slow-acting, so fall application improves soil for spring planting. Soil test kits are available at your local Extension Office. The Charlottesville-Albemarle Extension Office is located in the County Office Building off 5th Street Extended at 460 Stagecoach Road, Charlottesville. Kits and instructions are available at the second-floor office.
- **Disconnect, drain and roll up garden hoses.** Best to do it before it gets cold and they get stiff and hard to handle.
- **Drain rain barrels, outdoor water pipes and irrigation systems** that may freeze during the cold weather.
- **Clean and sterilize used trays and flats** (9:1 mixture of water and bleach) to prepare them for planting next year.
- **Rhubarb** plants that are four years old or more can be **divided and transplanted**. Prepare the site by digging deeply and incorporating compost.
- **When asparagus vegetation browns, cut off the tops of the plants to about 2-4" above the soil level.** Weed, and add a winter dressing of compost or aged manure to the bed.
- If you have been thinking about installing a **deer fence** around your vegetable garden, the fall and winter months are a good time to buy or [build it](#).

I hope you find this information helpful and recognize that some effort now, assures a more relaxed winter and easier start next spring. Thanks for your interest in following good gardening practices. I look forward to talking again next month. Comments are welcome.

Sources:

["Monthly Horticulture Tip Sheet: November,"](#) VCE Monthly Horticulture Tip Sheets, Virginia Cooperative Extension, Albemarle County/Charlottesville.

["Monthly Gardening Tips: November,"](#) Piedmont Master Gardeners website, Gardening Resources.

Cultivating Mushrooms

By Kaila Pennock | November 2024-Vol.10,No.11



Edible mushrooms have been used as food and medicine throughout history. Today, mushrooms are coming back into the mainstream as people gain awareness of their health benefits, umami flavors and cultivation techniques. There is an increasing number of studies documenting the bioactive compounds in many species, including delicious culinary mushrooms. These compounds are being studied for their antioxidant, anti-inflammatory, and anticancer effects. Still, many mushroom species can be expensive or hard to find. Because of this, DIY mushroom cultivation is gaining popularity. Mushrooms can be grown inside or outside and the methods can be anywhere from simple to more involved. This is a general overview of how mushrooms grow and some ways to cultivate them.



Golden Reishi (*Ganoderma curtisii*) by Amy Hill



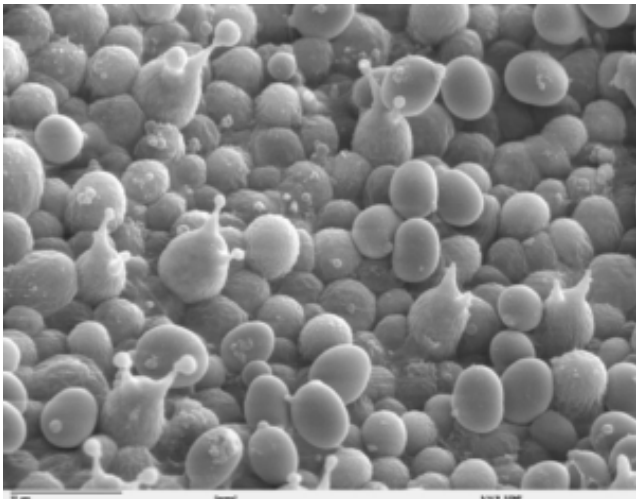
Shiitakes (*Lentinula edodes*) by Orv Lehman



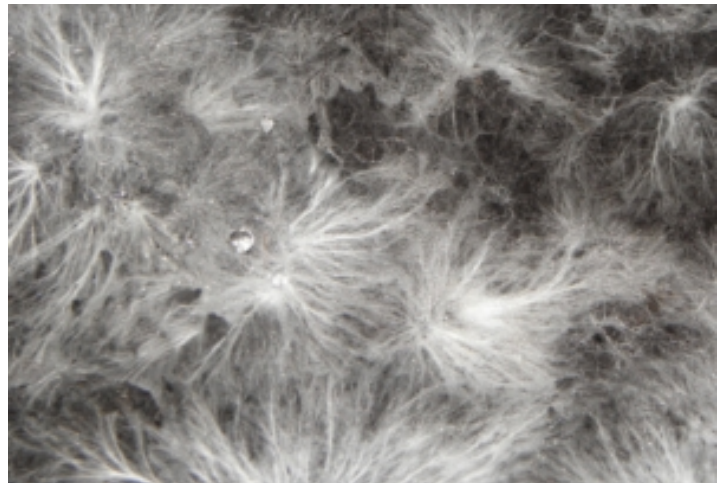
King Oysters (*Pleurotus eryngii*) by Orv Lehman

Spores are to mushrooms what seeds are to plants, agents of reproduction. While seeds are multicellular and most can be seen with the naked eye, spores are microscopic and usually unicellular. At full maturity, mushrooms will release spores into the environment. The spores germinate to form hyphae (root-like filaments) which fuse together to make mycelium.

Mycelium makes up the vegetative bulk of the organism and lives in the soil or other growing medium. This decentralized network of hyphae branches out consuming nutrients while producing fruit (mushrooms) in order to create spores and reproduce. Picking a mushroom does not harm the mycelium just as picking a fruit does not harm the tree.



Microscopic image of the spores of *Agaricus bisporus* (cultivated mushroom), released into the public domain by Dartmouth College



The mycelium of *Agaricus bisporus* (cultivated mushroom) by [Rob Hille](#), [CC BY-SA 3.0](#)

The majority of cultivated mushrooms are saprotrophs (decomposers). They obtain food by releasing enzymes which break down organic matter into simpler components. We have been able to mimic this process by providing organic material for them to consume.

Substrate is any growing material that provides nutrition, energy and moisture to the mycelium. Examples include grains, coconut coir, straw, and wood.

Spawn is a culture of mycelium that has grown through a sterilized substrate. It will hold the specific variety of mushroom mycelium until it is ready to be “planted” into another growing medium. Spawn is available in many forms and is kept refrigerated until use. Examples include grain spawn, grow kits and plug spawn.

Overview of growing mushrooms from spawn:

The grow space and grower must be clean to minimize microbial competition. The space should be out of direct sunlight. There are numerous ways to grow mushrooms from spawn but they all share three basic stages: inoculation, colonization, and fruiting.

Inoculation: This is the “planting” of the spawn into a sterilized or pasteurized substrate. This is done inside a clean container where the mushrooms will eventually grow from.

Colonization: This occurs during incubation, which is the period of time where the spawn grows through and consumes (colonizes) the substrate. The cultivator follows the environmental guidelines for the specific mushroom. Generally, low air flow and high humidity are required at around room temperature. High humidity can be achieved by misting or by using an enclosed container. It can take one to four weeks for the mycelium to fully colonize the substrate and be ready for fruiting. At this point the mycelium should appear white-ish throughout and smell good and earthy.

Fruiting: As long as the environment is acceptable most mushroom species will begin fruiting on their own when they are ready. However, there are several things a grower can do to support healthy fruiting. This usually includes providing a slight drop in temperature, increased airflow and brighter indirect light.



The substrate is fully colonized with mycelium. The grey oyster mushrooms are beginning to emerge. Photo by Orv Lehman



The grey oysters (*Pleurotus ostreatus*) are ready to harvest. Photo by Orv Lehman

Mushroom Grow Kits: All in One

Grow kits are a straightforward option for mushroom cultivation. These are bags or blocks of fully colonized substrate that are ready to fruit. The first two stages (inoculation and colonization) have been done already. This is a good place to start to have the satisfaction of seeing mushrooms grow easily.

The supplier will provide specific instructions but generally the kit is placed inside with good airflow and the bag is cut or sliced open. The kit is misted everyday and the mushrooms will begin to grow out of the opening. Mushroom fruiting times vary. For example, oysters usually fruit after a few weeks, while reishi will

slowly develop over a few months.



Two growth stages of red reishi (*Ganoderma lucidum*)



Photos by Orv Lehman

Ready to grow kits can be left closed and put in the refrigerator to keep them dormant for a month or sometimes longer depending on the company.

After the first flush (harvest of mushrooms), kits can usually produce a few more flushes before the substrate is spent. Let the block rest for a couple weeks, then start daily misting again. New growth typically appears around the edges of where old growth was cut off.

Once done, the old mushroom blocks make a fantastic amendment to compost. They add moisture and help the other organic materials break down faster. They can also be used as an amendment for turf to help

improve the soil structure. For use in gardens, let them age outside for 6 months before applying.

There are many reputable companies for getting mushroom grow kits. Below are some examples.

<https://sundreamsfarm.com/collections/mushroom-growing-kits>

<https://fatmoonmushrooms.com/pages/lions-mane-grow-kit-instructions>

<https://www.fieldforest.net/category/indoor-grow-kits>

<https://sharondalefarm.com/>

Overview of Growing from Logs with Spawn Plugs

Growers may also choose to get spawn plugs for logs if they want a longer term outdoor project. Besides the initial inoculation, caring for mushroom logs is pretty hands off - just make sure they don't dry out and have some patience.

The grower drills holes in logs cut from healthy trees. The spawn plugs are placed into these holes and then they are sealed with wax to keep the spawn from getting contaminated or drying out. The inoculated logs can be leaned against a building or stacked in a shady spot that gets rainfall. Logs should be watered during hot/dry periods but overall, occasional deep waterings are better than frequent light waterings.

Fruiting time will vary but generally logs will produce their first mushrooms anywhere from six months to two years after inoculation and will continue to produce flushes in cycles for up to eight years.

There are also pre-inoculated logs available which may give quicker results as the "planting" of the spawn and some colonizing of the log has been done already.

Shiitakes are a popular and easy choice for log growing but any wood decay mushroom will work, such as turkey tail or lion's mane.

Field and Forest has a helpful tree species/mushroom suitability chart as well as more detailed instructions:

<https://www.fieldforest.net/category/growing-mushrooms-on-logs>



Turkey Tails (*Trametes versicolor*) by Amy Hill



Shiitakes (*Lentinula edodes*) by Orv Lehman



Lion's Mane (*Hericium erinaceus*) by Claire Denton-Spalding

Harvesting, Cooking and Storing

When to harvest will depend on the species and your preference. ***Mushrooms can grow quickly once they emerge and there are often multiple stages present at once.*** For example, the most common mushrooms sold in the United States all come from the same species, *Agaricus bisporus*, harvested at different stages in their growth cycle and selectively bred for color. The white button mushroom and the crimini (baby bella) are the immature forms while portobello is the mature form of *Agaricus bisporus*.

To appreciate the complex flavors of a new mushroom, it is nice to ***try them alone first by dry cooking them.*** This means putting sliced mushrooms in a dry pan (no oil/butter) over medium heat and cooking the liquid off, turning occasionally. The water coming out of the mushrooms will stop them from sticking. Once they seem dryer, add butter/oil and cook until they brown and develop crispy edges. This technique is especially beneficial for oyster and lion's mane mushrooms, as it removes excess moisture and concentrates their succulent flavor.

Mushrooms should be stored in a paper bag in the fridge so they can breathe. This will greatly extend their shelf life compared to plastic or glass. The shelf life will vary by mushroom. For example, oysters last around a week, whereas shiitakes can last up to three weeks properly stored in the fridge. For longer term storage, mushrooms can also be dried and put into sealed containers in a cabinet or other dark cool place.

Sources:

Featured Photo: Chestnut Mushrooms (*Pholiota adiposa*) by Orv Lehman of Hawk Nest Farm

[A Beginners Guide to Growing Mushrooms at Home](#) - Utah State University Extension

[A review of the therapeutic and biological effects of mushrooms - PMC](#) - National Library of Medicine

[Agaricus bisporus, Tom Volk's Fungus of the Month](#) -University of Wisconsin Plant Teaching Collection

[Growing Mushrooms at Home](#) - University of Florida Extension

[Mushroom Gardening](#) - Purdue University College of Agriculture

[Mushrooms - The Nutrition Source](#) - Harvard School of Public Health

[Seven Stages of Cultivation](#) - Cornell Small Farms Program

[Shiitake Mushroom Production: Inoculating Logs with Spawn](#) - Ohio State University Extension

[Six Steps to Mushroom Farming](#) - Penn State Extension

[Spent Mushroom Substrate](#) - Penn State Extension

[What are Fungi?](#) - Utah State University Herbarium