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Extension Gardener provides timely, research-based horticultural information. We publish four issues per year. Send comments about *Extension Gardener* to:

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Growing Trees from Seeds

I love to grow trees from seeds. Ever since I was a kid in the hills of middle Georgia, I have been stooping over and filling my pockets with acorns and seeds each fall. Since moving to North Carolina, I have located some local places to collect seed. During my many tours of local gardens I gather seed, usually with permission.

I am sure my wife grows tired of hearing the click-clack in the clothes dryer from acorns that I have left in the pockets of my blue jeans.

In years past I have grown many different trees from seed. Bald cypress, bur oak, white oak, sawtooth oak, longleaf pine, Osage orange, and catalpa trees are just a few. Eventually I plant these trees in my yard or give them away to friends. There is a certain satisfaction in watching a tree you collected and grew from seed mature into a large tree. It amazes me to think that the little stash of embryonic life stored inside of an acorn can grow into a mighty tree one day.

Last year I collected a handful of chestnut oak (*Quercus prinus*) seed while on a camping trip. I brought the seeds home and planted them in



The colorful seeds of hearts-a-bustin' (*Euonymus americanus*) need periods of warmth and cold to germinate.
©Tom Potterfield, flickr.com, CC BY-NC-SA 2.0

pots. Oak seeds need a certain number of hours of cold before they germinate. The easiest way to give the seeds their appropriate cold hours is to leave the potted acorns outside through the winter. One must cover the pots with window screen to keep the squirrels from eating the acorns. In the spring the seeds will germinate.

This past summer I collected pawpaw seed from the custard-like flesh of pawpaw fruit a friend gifted me. According to my copy of *The Reference Manual of Woody Plant Propagation* by Michael Dirr and Charles W. Heuser Jr., these seed germinate easily with no special treatment.

I also gathered seed from a hearts-a-bustin' shrub (*Euonymus americanus*). This member of the *Euonymus* genus is not as easily germinated, requiring three months of warm and three months of cold.

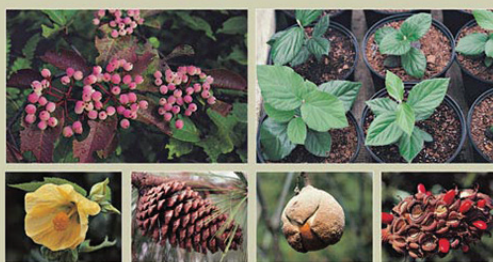
I have planted many hundreds of trees over the years in my capacity as a horticulturist and nursery grower. I like to think that the plants I have grown from seed are a kind of legacy. Maybe one day my grandkids will enjoy playing in the shade of a tree their grandfather planted way back in the late 1900s.

For more information on growing plants from seed, see the "Propagation" chapter in the *North Carolina Extension Gardener Handbook*.

—Steve Pettis

The Reference Manual of Woody Plant Propagation

SECOND EDITION

From Seed to Tissue Culture

MICHAEL A. DIRR AND CHARLES W. HEUSER, JR.

Refer to a propagation manual for details on germinating seeds and growing seedlings of different tree species.
©Timber Press, Portland, Oregon.

Extension Showcase

Albemarle EMGV Garden Show

The Ninth Annual Albemarle Extension Master Gardener Volunteers' Spring Garden Show, "A World of Gardening," will be held on Saturday, May 4, 2019, at the Perquimans County Recreational Center, 310 Granby Street, Hertford, from 9:00 a.m. to 3:00 p.m.

This annual fundraising event to support the Extension Master Gardener volunteers (EMGVs) scholarship fund will feature plant sales, gardening items, locally made crafts from a variety of vendors, a children's corner, "Ask an EMGV Booth," homemade baked goods, educational speakers, a 50/50 raffle drawing, and more. Lunch will be available for purchase and admission is free. This is the EMGVs only fundraiser for their scholarship, the Katherine G. Shook Extension Master Gardener Scholarship, which is awarded each year to students from Gates, Perquimans, or Chowan counties who are pursuing a career in agriculture, horticulture, natural resources, or a related field.

For more information, contact Katy Shook, Extension agent for Gates, Perquimans, and Chowan counties at kgshook@ncsu.edu, or call (252) 482-6585. Visit our website at perquimans.ces.ncsu.edu/spring-garden for additional information on vendors, exhibits, and speakers. The site includes directions to the event.

—Pat Winter

Extension Master Gardener Volunteers enjoy their Albemarle Garden Show. ©Pat Winter, Albemarle Master Gardener Volunteer



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Smart Gardening: Turn garbage into gold



Vermicomposting produces a rich soil amendment.
©Bonnie Kelley, Scotland County EMGV

or outside so long as it is protected from direct sun and extreme temperatures: 59°F to 77°F is the optimum temperature range. The bedding can be coconut coir, shredded black-and-white newspaper, paper bags, or cardboard, but no glossy paper. The bedding should be soaked in water for at least 10 minutes to ensure complete saturation, then squeezed out and fluffed up to allow air circulation. Adding a handful of healthy garden soil introduces beneficial microorganisms and helps earthworm digestion. To avoid flies and rotting odors, place small pieces of vegetable scraps under 2 inches of the bedding and only feed when needed. The castings will be ready to harvest in four to six months. An easy way to remove the worms is to prepare an identical second tub and set it directly on top of the bedding in the original tub. Placing food in the new top tub will motivate most of the worms to migrate into the new tub. The harvested nutrient-rich vermicompost can be used immediately by amending into the soil or topdressing around plants and lawns. For more information on vermicomposting, visit the chapter on "**Composting**" in the **North Carolina Extension Gardener Handbook**.

—Mack Johnson

Food Production: Grafting tomatoes

In the Blacklands area of the NC coastal plain, one of the main challenges we have when growing tomatoes is a soilborne disease called bacterial wilt. This disease attacks crops in the family Solanaceae, which includes tomatoes, peppers, eggplant, potatoes, and tobacco. The best defense against bacterial wilt is crop rotation. Do not grow any of the plants from this family in the same spot more than one out of every four years. Once you have bacterial wilt in your soil, it is very difficult to manage. No pesticides are effective against this disease. So what do you do if bacterial wilt occurs? You can move your garden or consider grafting onto a rootstock resistant to bacterial wilt.

Grafting is joining two separate plants together as one. The top of one plant (the scion) is cut and grafted onto the bottom (rootstock) of another plant. There are several rootstocks that have proven resistance against bacterial wilt. Talk with your local Cooperative Extension agent to explore what is currently available. A tomato rootstock I have used that is readily available goes by the catchy name RST-04-105-T-F1. To graft, start your plants from seed. The rootstock should be started three to seven days before the scion to help the plants match up in size. The seedlings are ready to graft once they produce their second set of leaves. You can manage temperature and light to speed up or slow down plants. It is best to plant in six-pack cells for easier reach. Slice the tops off using a sharp blade and join the scion top and rootstock bottom together using a grafting clip. Place these plants in a healing chamber for about a week and then transfer to the field a week later. For more information visit: vimeo.com/266307225 or the NC State Extension publication on **Grafting for Disease Resistance in Heirloom Tomatoes**.



Grafting joins two plants into one with the desired resistance. ©Gene Fox, Extension agent, Beaufort, Hyde, Tyrrell, and Washington counties

—Gene Fox

Pest Alert: Squash vine borer

The squash vine borer, *Melittia satyriniformis*, is a pest that vegetable gardeners have come to dread in their squash and zucchini beds. Larvae emerge in late May, burrowing into stems of *Curcubita pepo* and *C. maxima* crops, including summer squashes, winter squashes, gourds, and pumpkins. Larval tunneling causes wilting symptoms initially. But as the larvae feed and grow, the vine or entire plant eventually succumbs. If you observe wilting despite seemingly adequate soil moisture, look for small entrance holes and sawdust-like frass at the base of vines. Larvae leave the vine to pupate in the soil four to six weeks later. Adult squash vine borers are robust moths with red and black bodies and partially transparent wings. Their appearance and flight behavior are almost reminiscent of bees or wasps. Two generations per year are possible in North Carolina.



Squash vine borer larva. ©Jim Jasinski, Ohio State University Extension, Bugwood.org

Squash vine borer management is primarily cultural. Plant susceptible crops as early as possible to maximize production before population pressure is high. With frequent and close inspection, you may be able to extract larvae before they've caused too much damage. Carefully cut a slit along the base of the vine near entrance holes and frass, and then remove and destroy the guilty larva. Rotating out of infested soils (where the pupae overwinter) for several years may reduce future local populations. Remove any infested debris, and till soils to kill any remaining pupae in the soil. Row covers are generally not feasible, as they prevent pollinators from accessing and pollinating the monoecious flowers of squash family crops. Organic and synthetic insecticides are available, but are not very effective unless applied before larvae hatch.

—Matt Jones

Lawns: Diagnosing turf problems—observations from the field

Here are some of the most common turf problems I have seen in home lawns in eastern North Carolina. Compacted soils can restrict root growth and make turf more susceptible to drought stress. To alleviate compaction, rent a hollow-tine aerator this spring and consider aeration once a year in your home lawn. This will create pore space that roots, fertilizer, and moisture can penetrate. Soils in our region are typically acidic and have low nutrient-holding capacity. Take a soil sample to determine how much lime and fertilizer your soil needs. Lime can be broadcast over turf any time of year but can take up to six months to reduce soil acidity. As for fertilizer, NC State Extension recommends 1 pound to 2 pounds of nitrogen per 1,000 square feet in centipede lawns or 4 to 6 pounds of N for bermudagrass in a growing season. Do not fertilize warm-season turf before May.

A customer once told me that his centipede lawn “loved water.” He had more dollarweed, Virginia buttonweed, and nutsedge in his yard than centipede. Overwatering can give certain hard-to-control weeds an advantage. NC State Extension recommends 1 inch of irrigation per week during the growing season. Most broadleaf weeds are easily controlled with the right postemergent herbicide. Crabgrass and goosegrass, however, are difficult to control once they become established in the lawn. Control warm-season grassy weeds by applying a preemergent by March 1st. (Consult with your county Extension agent and read the herbicide label carefully before applying.) There are a few difficult weeds, such as sedges, *Lespedeza* species, Virginia buttonweed, doveweed, oxalis, and wild garlic, that require any or all of these management strategies: specific herbicide, repeated applications, or proper timing. Ask your Extension agent for help correctly identifying weeds and for specific weed management and herbicide recommendations. For more information on diagnosing and managing turf problems, visit the Integrated Pest Management Section of the the “**Lawns**” chapter in the **North Carolina Extension Gardener Handbook**.

—Jason Weathington

Tips & Tasks

Free soil testing begins in April

Understanding soil health is among the first steps in successful garden establishment.

Drainage, aeration, organic matter content, plant nutrients, and soil acidity can all affect how well plants survive and thrive.

A soil test will help you understand many of these factors and can be especially helpful in establishing baseline nutrient levels and pH so you can make better decisions when applying fertilizers and lime.

Fortunately for NC gardeners, our Department of Agriculture & Consumer Services operates the largest publicly-funded soil lab in the country. And from April to November every year, soil testing is free!

Your county Cooperative Extension center can provide soil test boxes and forms, provide instructions on proper soil sampling methods, and even help you interpret the soil test report.

Knowing how much and what kind of fertilizer and lime to add will ensure healthy plant growth and reduce the excess nutrient runoff that pollutes our watersheds.

—Matt Jones



Collect soil samples using plastic containers, let soil air dry, and screen out big chunks, including rocks and sticks. Mix several soil samples from the same location before sending a sample in for testing.
©Dwight Sipler, CC BY 2.0, flickr.com

Helping You Grow

Homegrown videos

A new website launched in 2018 to help home gardeners with common questions is **Home-grown**, published by the College of Agriculture and Life Sciences at NC State.

New videos are available every month. Topics include growing vegetables, caring for plants in the garden, where to find fresh produce, and how to use seasonal foods in the kitchen.

Along with each video, a link to additional information is provided for those who would like to dig deeper into a topic.

One video that will interest many home gardeners is **Protect the Pollinator—NC State Works to Preserve Billion Dollar Bees**. It explains what is being done to protect honeybees.

With spring just around the corner and all the fresh berries that come with warmer weather, a **Very Berry Tart** video might whet the appetite.

Another great video is **Worms Can Recycle Your Garbage**, which demonstrates how to build a worm bin to recycle kitchen scraps and describes the benefits of worm castings in the garden.

Visit cals.ncsu.edu/homegrown to see what other videos are available.

—Shawn Banks

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Plant Watch: Hybrid winter-blooming witch hazels



Hybrid witch hazel (*Hamamelis x intermedia*). ©Paige Patterson

Hybrid winter-blooming witch hazels, blooming as early as late January, are a must-have for your garden. They offer almost 30 days of blooms, fall foliage color, and hardiness in USDA zones 4 through 9. All plants that are commonly referred to as witch hazel are in the genus *Hamamelis*. These winter-blooming hybrids, *Hamamelis x intermedia*, make up a group of hybrids between *H. japonica* and *H. mollis*. The species name indicates that they have intermediate characteristics between the other two species. The plants are loosely branched, multistemmed shrubs or small trees, usually 15 to 20 feet tall. With pruning, a specimen can be maintained as a single trunk tree. *H. x intermedia* prefers full sun, and moist soil. Cultivars have bloom colors ranging from bright-yellow to red. Noteworthy cultivars include 'Arnolds Promise' with yellow blooms, 'Diane' (red), and 'Jelena' (coppery-orange). For more pictures and information, visit plants.ces.ncsu.edu/plants/all/hamamelis-x-intermedia-h-x-media/.

—Paige Patterson

Incredible Edibles: Culinary herbs

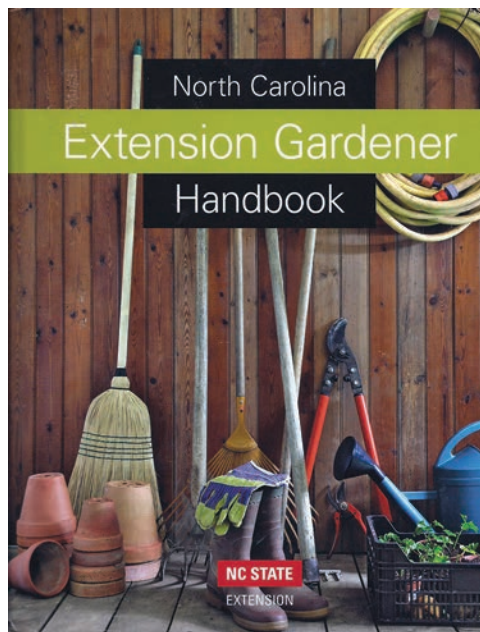
Use herbs to perk up dishes and add flavors that transform a simple meat or vegetable into something special. Herbs are generally easy to grow and have few pests and diseases. They require full sun, good drainage, and very little maintenance to thrive, and can be easily grown in containers or in the ground. To harvest herbs for cooking, cut or pick them in the morning after dew has dried. They can then be used fresh, like basil for bruschetta. Or they can be dried, like rosemary, to be used throughout the year. To dry, hang bunches indoors in a dry place (like an attic) and cover with a paper bag to prevent dust from accumulating. Also avoid hanging in the sun, which spoils color and dissipates oils. Once dry and brittle, store in an airtight container. Use herbs in teas, oils, salts, vinegars, or individually to add a kick to any meal.

—Hanna Smith



Herbs are easy to grow in garden beds or pots. ©Hanna Smith

Sustainability: Gardening by the book



The **North Carolina Extension Gardener Handbook** is a national-award-winning gardening and landscaping guide. Written by NC State Extension specialists and agents, it has the latest research-based information on soils, composting, design, propagation, gardening, and pest management. It is a fundamental reference for both seasoned gardeners as well as beginners, explaining the "why and how" of growing fruits, vegetables, nuts, lawns, native plants, ornamental trees, shrubs, vines, ground-covers, and plants in containers. The handbook includes 728 pages, 21 chapters, eight appendices, 1,067 color images, a map, 109 tables, an index, and a glossary.

This is the text used in the **NC Extension Master Gardener** Volunteer Initial Training program. It is available free online and as a hardback or eBook. Visit go.ncsu.edu/intro-eg-handbook.

—Lucy Bradley