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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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## Plant spring-flowering bulbs now

While you're in the garden this fall, consider planting some spring-blooming bulbs. A true bulb is a modified stem that is surrounded by scale-like modified leaves that store food for the shoots. But when you're shopping for bulbs at a garden center, you may also be purchasing corms, tubers, tuberous roots, or rhizomes. It's easiest not to get too caught up in the botany; these "bulbs" are all grouped together because their care in the garden is generally the same.

You can usually find bulbs at the garden center, but you may choose to order from a catalog or online retailer for a wider selection. Ordering well in advance can often open up more options, as rare varieties may sell out quickly. However, even if you wait until the fall, you're bound to find some beautiful options for planting in your garden. Select large, firm bulbs, and avoid any bulb that is soft or mushy.

Most people think of tulips, daffodils, and hyacinths when they are planting spring-flowering bulbs. Gardeners in North Carolina often grow tulips as annuals because they don't reliably come back in all areas. Daffodils are a good choice if deer are a pest in your yard, and daffodils tend to return to the garden year after year.

You may wish to branch out to other options. Crocuses offer color very early in the spring. Try an allium for extra interest in the garden. Their



Daffodils come in a variety of sizes and colors.  
©Leslie Peck, Forsyth County Extension Center

globe-shaped flowers are exciting, especially if you're gardening with kids. For gardeners battling deer, consider growing summer snowflake (*Leucojum aestivum*) or a variety of the genus *Scilla*.

After selecting bulbs, it's time to plant. Wait until soil temperatures have cooled to below 60°F. Depending on where you live in North Carolina, this soil temperature could occur in October or as late as December or January.

Bulbs grow best in well-drained soil; incorporate compost or peat moss into the top 12 to 18 inches of soil to improve drainage, especially if you have heavy clay soil. Dig with a trowel or bulb planter, or attach an auger bit to your drill. Generally, you want to plant the bulbs at a depth that is two to three times the width of the bulb.

For optimal color and impact in the spring, plant bulbs close together. You can even layer smaller bulbs on top of larger ones, then finish with some cool-season annuals on top. Planting the bulbs in a drifting pattern will be visually pleasing when they emerge in the spring.

After planting bulbs, it's a good idea to put some slow-release fertilizer and mulch down. Follow your soil test report for the best fertilizer option. Then sit back, let the bulbs chill in the winter, and wait for the springtime show your bulbs are sure to bring.

—Leslie Peck



Early crocuses usher in spring with fresh color.  
©Leslie Peck, Forsyth County Extension Center

## Extension Showcase

### Kindergarten Thanksgiving

When children of various ages were asked, "Where does your food come from?," many answered "Walmart" or "grocery stores."

The Carteret County office of NC Cooperative Extension partners with the Beaufort Historic Association (BHA) and NC State Extension Master Gardener<sup>SM</sup> volunteers (MGVs) for an annual fall educational event for students called "Kindergarten Thanksgiving" that brings students from regional schools to BHA's property to learn about colonial life.

At one station, MGVs teach kindergartners about colonial vegetables, herbs, and flowers as well as gardening concepts at the vegetable garden demonstration site.

MGVs ensure kindergarten students know that fruits and vegetables come from plants grown on a farm before being shipped to a grocery store or restaurant.

—Dee Edwards

MGV Diana Mazza helps children learn about colonial fruit and vegetable gardening.  
©Dee Edwards-Smith, Carteret County MGV



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## Smart Gardening: Lessons learned from Hurricane Florence



Shade trees help to remove atmospheric carbon and cool concrete streets and structures. ©Jeffrey Beall, CC BY-SA 2.0, flickr.com

There is no scientific controversy regarding climate change. In fact, over 99 percent of climate scientists agree that our weather and our climate are changing due to increased greenhouse gases in our atmosphere. As gardeners, we can be at the forefront of mitigating these effects by leading through our actions:

- **Plant trees and shrubs.** If you have the space (and you do), trees and shrubs planted in the right location can provide years of benefits, including carbon sequestration from the atmosphere. Not only can trees remove atmospheric carbon, but they also can reduce CO<sup>2</sup> emissions by cooling nearby homes and buildings by up to 10°F, reducing energy use on air conditioning
- **Minimize carbon-emitting inputs.** Synthetically produced

chemicals require energy to manufacture, as do organic nitrogen-based fertilizers. Consider onsite composting and cover crops as green alternatives to fertilizers.

- **Manage lawns according to their needs.** Healthy lawns can sequester a lot of carbon but need to be managed appropriately. Follow proper mowing heights, water deeply and infrequently, and leave behind grass clippings to ensure a healthier, more robust turf. Convert troublesome turf areas to new landscape beds to make room for trees, shrubs, and herbaceous plants.

- **Choose locally-adapted plant species.** Native plant species that flower throughout the year provide a myriad of benefits in addition to mitigating climate change impacts. Protect natural areas around your yard because their destruction would release carbon from plants and soils into the atmosphere. Natural areas also protect indigenous plants and preserve the genetic diversity of wild plant populations.

—Sam Marshall

## Food Production: Fall vegetables

Unlike the fruits of vegetables grown in the summer (tomatoes, peppers, squash), cool-season crops are primarily leaves, stems, and roots. Cool-season crops can be grown in late winter through early spring and from late summer through early winter. For a spring crop, plant cool-season vegetables by February 15th. In the fall, the timing varies depending on whether you are planting from seed or using transplants. If, like head lettuce, the plant is harvested all at once, you can extend the harvest by staggering the planting dates rather than planting all at one time. NC State Extension has a great planting guide for vegetables that includes planting dates, recommended planting type (seed or transplants), days until harvest, planting depth, and planting space. *The Vegetable Planting Guide for Eastern North Carolina* can be found online:

[go.ncsu.edu/eastcalendar](http://go.ncsu.edu/eastcalendar). Examples of cool-season crops are lettuce, broccoli, cauliflower, Brussels sprouts, collards, kale, radishes, rutabagas, Swiss chard, turnips, and cabbage. The first step to a successful garden is soil preparation. Collect soil samples and submit them to the **NC Department of Agriculture & Consumer Services** to be tested. The lab will send a report back that will recommend fertilizer and describe the pH in your garden. The macro- and micronutrients in your soil are only available to plants within a narrow band of pH. Outside of this range (too high or basic to too low or acidic), your plants will starve and you might too! A good season depends on the health of your plants at the beginning. Buy plants from a reputable nursery or grow them yourself from seed. Make sure they have full sunlight. And don't forget, plants need about an inch of water each week.

—Gene Fox

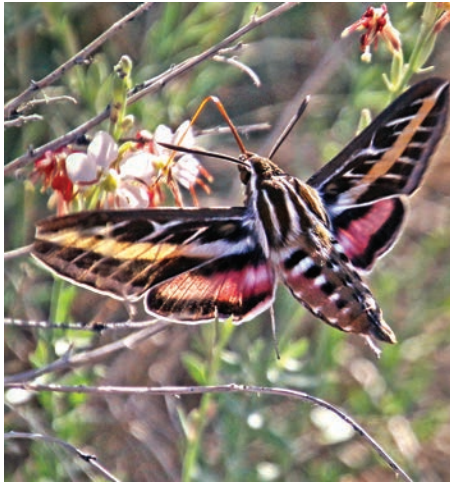


It's time to plant cool-season crops.  
©Gene Fox, NC Cooperative Extension



## Pest Alert: A vegetable gardener's dilemma

During the summer late in the day or early evening, you can often find what looks like a fuzzy small hummingbird at flowers in your garden. These pollinators are called hummingbird moths, sphinx moths, and hawk moths. They have tongues that can be up to 4 inches long, allowing them to drink nectar while they hover over flowers. These beautiful moths lay their eggs on a variety of plants. The "hummingbird" moths we often see are white-lined sphinx moths, the parents of the tomato hornworm caterpillar. These caterpillars and their cousins tobacco hornworms are voracious foliage eaters, doing damage to plants in a short period. Tomato hornworm is a pest of not only tomatoes, but also eggplants, peppers, and potatoes. Because of their green color, the caterpillars are often hard to see in the plants. Here is the dilemma: we like hummingbird moths but can't tolerate tomato hornworms. Nature can come to the rescue and balance things out. Parasitic wasps often will lay their eggs on the caterpillars. The eggs will grow and pupate using the hornworm as their home. If you see a caterpillar with these egg casings, leave them alone. This is nature's way of destroying pests. If you cannot tolerate tomato hornworms, be sure to till your garden in the spring. This may help destroy some of the pupating insects. You can also handpick and drop the caterpillars into soapy water or spray *Bacillus thuringiensis* (*Bt*) which is a naturally occurring bacteria that targets only caterpillars. *Bt* does not harm other insects, such as many beneficial insects.



Hummingbird moths such as the white-lined sphinx moth are beautiful additions to any garden. Not only do they look pretty; they are native pollinators.  
©Renee Grayson, flickr.com, CC BY 2.0

—Shannon Newton

## Lawns: White grubs

White grubs are the larvae of several scarab beetles, including the dreaded Japanese and June beetles. These grubs have cream-colored bodies with yellow to brownish heads and six legs. They vary in length from ¼-inch to ½-inch depending on the species. These beetles hatch in late summer and begin feeding on the roots of all grass species in your lawn. Adults feed on many other species of plants, including roses, grapes, and crape myrtles.

As with all pest problems, a variety of integrated pest management (IPM) strategies can be effective. The first is always optimizing the plant's health to increase its resilience. With turf, ensure that it has adequate sunlight and that you are watering, fertilizing, and mowing appropriately. Sometimes a pest problem indicates that you are trying to grow a plant that is not adapted to the location. Replacing it with a better-adapted plant is the solution. Japanese beetle traps are not an effective cultural management strategy. They lure in additional beetles, increasing the problem. Milky spore bacteria, available as Doom®, Japidemic®, or Milky Spore, is an effective biological management tool that kills grubs when applied in late September or early October to a soil with a pH between 6 and 7. Though the results are not as rapid as with chemical insecticides, the effects last many years. *Bacillus thuringiensis* (*Bt*) subspecies *galleriae* is another biological management option.

Timing and soil moisture are critical with chemical management strategies. Preventive treatments of Merit and Mach 2 can be made before the eggs are laid in June and July. These products should be used only in areas that have a history of grub infestations. Curative treatments can be made when newly hatched grubs are actively feeding near the soil surface in August through October. As always, read and follow label directions when applying any pesticide. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by NC State University nor discrimination against similar products or services not mentioned.

—Brad Hardison

## Tips & Tasks

Spring-flowering bulbs such as tulips, daffodils, hyacinths, and crocus are among the first flowers to appear in spring, adding lots of color to the landscape and signaling that warmer days are around the corner.

- Extend the bloom period by selecting a variety of bulbs with very early to midseason bloom times. See **Table 10-1** in the *Extension Gardener Handbook*.
- Keep bulbs in a cool, dry, and dark place until planting.
- Mix bulbs in beds with later emerging perennials such as daylilies or cannas so that after the bulbs finish flowering and the foliage begins to die back, they will be replaced by something else.
- Crocus bulbs should be planted about 5 inches deep and about an inch apart, with larger bulbs such as tulips and daffodils approximately 8 inches deep and 3 to 6 inches apart.
- The flower display will be most effective if you plant in large clusters in confined areas rather than in evenly spaced lines or sparse plantings throughout a large area.
- Learn more about growing bulbs in the *Extension Gardener Handbook*.

—Matt Stevens

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## Helping You Grow

### NC Extension Gardener Plant Toolbox

Updates and changes to the NC State Plant Database make the site an even more valuable reference for gardeners ([plants.ces.ncsu.edu/](http://plants.ces.ncsu.edu/)). You can still search by scientific or common name and use **Find a Plant** to select the perfect plant for a site. Now, in addition to considering what cultural conditions you can offer a plant and your preferences on color and size, you can factor in what function the plant should serve in the landscape (like attract wildlife, provide food or fragrance) and what challenges it might need to withstand (such as deer, wet soils, salt). The database automatically recommends alternatives to invasive plants and also suggests native alternatives. **Identify a Plant** is a new feature that allows you to enter known information (like leaf arrangement, flower color, leaf shape) to identify a plant. In addition to showing plants that are likely matches, the database tells you which plants are often confused with the one identified. Another new feature provides quick plant lists, such as fire-resistant plants, beneficial coastal plants, and plants for wet sites. Plant descriptions include photos, audio and phonetic pronunciations of botanical names, video profiles, and other details (such as attributes, cultural requirements, and landscape value). Such information can help you decide if a plant is the best choice for your location and if it can provide the desired function.

—Hanna Smith

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## Plant Watch: Virginia sweetspire

Fall is a spectacular time for native perennials. *Itea virginica*, Virginia sweetspire, has showy racemes of white flowers that bloom in late spring and make way for glossy green leaves that turn vibrant red and orange in the fall. The flowers are produced on last year's growth or old wood. Depending on the cultivar, the flowers may be upright or cascading. Little Henry® is a popular dwarf cultivar of this plant with an attractive arching form. It can handle a variety of soil conditions and planting sites, including low and wet sites. Not only is this plant native, it is deer-resistant, a source of nectar for pollinators, drought-tolerant, and produces an attractive display for three-fourths of the year. Little Henry® is 3 to 5 feet tall and has a spreading growth habit in an urban landscape setting. It can grow taller in a more natural, shaded setting. For more information, visit the NC Extension Gardener Plant Toolbox: [plants.ces.ncsu.edu/plants/itea-virginica/](http://plants.ces.ncsu.edu/plants/itea-virginica/).



Virginia sweetspire displays vibrant fall foliage.  
©Distant Hill Gardens, CC BY-NC-ND 2.0

—Lauren Hill

## Incredible Edibles: Make room for muscadines



'Supreme' muscadine. ©Jeana Myers, Wake County Extension Center

The muscadine grape, *Vitis rotundifolia*, originated in the Southeast, thrives in our heat, and defies diseases and insects that decimate their *Vitis vinifera* relatives. Muscadines can be dried, eaten fresh, made into desserts, or fermented into sweet wines. Most muscadines are dark-skinned, but there are bronze cultivars, some of which are called "scuppernongs" because they were first found along the Scuppernong River in North Carolina. You can choose a cultivar based on fruit color, size, sugar content, skin thickness, cold hardiness, ripening time, and whether the flowers are self-fertile or require a second vine for pollination. 'Supreme' (female) and 'Nesbitt' (self-fertile) are the two purple varieties rated in the top five fresh-eating cultivars in North Carolina, and 'Summit,' (female), 'Tara' (self-fertile), and 'Triumph' (self-fertile) are the three bronze varieties in the top five. They need full sun and good drainage but are otherwise an easy plant for every garden. For more information, visit [grapes.ces.ncsu.edu/muscadine\\_grape\\_production/](http://grapes.ces.ncsu.edu/muscadine_grape_production/). —Jeana Myers

## Sustainability: Using mulch in the vegetable garden

Using mulch in your vegetable garden will help to conserve moisture, reduce weeds, discourage disease, and improve soil health. If your goal is organic gardening, mulch will help reduce inputs such as fertilizer and pesticides. And like landscape mulch, it may also improve the garden's appearance. Any kind of mulch can be used in the vegetable garden, but the ideal one is a weed-free hay straw. Apply in a 2-to-3-inch layer over bare soil. Avoid using landscape fabrics or plastics as they are not necessary in most home beds. Mulch can be applied before or after planting. Mulch should be applied once or twice a year and can be tilled in as a soil amendment at the end of any season. Mulch may also help overwinter temperate vegetable plants like lettuce and kale. Snuggle up the mulch around the crowns of vegetable plants when freezing temperatures are expected. Keep in mind some additional tips: look for weed-free mulch, consider an organic source to prevent any carryover of herbicides into the vegetable garden, avoid letting the mulch pile against the stems of plants, and remove established weeds prior to application. —Katy Shook



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