



# Extension Gardener

NC STATE UNIVERSITY

NORTH CAROLINA COOPERATIVE EXTENSION

Summer 2009

Empowering  
gardeners.  
Providing  
garden  
solutions.

## Gardens of Water: The Basics

**W**ater gardens can be designed to fit almost any landscape, no matter how large or small. When choosing the location of a pond or pool, consider placing it so that it can be appreciated through a window from the house or as a focal point in the landscape.

There are several ways to create a water garden. The most popular is using a plastic liner, which comes in PVC (polyvinyl chloride), butyl rubber or polyethylene materials. These liners are chemically inert and safe for fish and plants. They come in various thicknesses, from 20 – 45 mils, and generally last anywhere from 10 – 20 years. The liner will be the most costly item, with the price based on the size of your water garden and liner type. Fountains and waterfalls add beauty and a focal point to a water garden. Place the focal structure where it will have the most impact.

A pool can be stocked with four types of plants: deep-water plants, bog plants (marginals), oxygenators, and floating plants. A mix of these plant types ensures a thriving, self-sustaining system. Cover 60 – 70% of the pond surface with floating plants, such as water hyacinth, and/or container plants with floating foliage, such as water lilies. Place 1 or 2 bunches of submerged or oxygenating plants per square yard of pond surface area. Many aquatic plants are very aggressive and should be planted in containers to prevent spreading and overcrowd-

ing. Fill the containers with heavy garden soil, and avoid chemicals or fertilizers that can harm aquatic life. Pack the soil tightly in the container and 1 – 2 inches from the container rim. Cover the remaining depth with pea gravel to keep the soil from floating up, and place the container at the correct depth in the pond. Plants should be introduced to the pond during the growing season. In newly constructed pools, place the plants several weeks before introducing fish.

You must wait 24 – 48 hours before stocking the pool with fish and aquatic plants so any chlorine can evaporate. If your water is treated with chloramine or chlorine dioxide, use counteractive chemicals from a water-garden supplier. Various brands are available; many add enzymes, aloe and other ingredients to help keep fish healthy during their transition. Combining fish and aquatic plants creates an ecological balance in the pond. In addition to a filter system, fish and aquatic plants should counteract any algae growth that occurs after construction. It can take anywhere from 6 – 8 weeks to establish a balance.

As with any garden, maintenance is necessary to keep a water garden thriving. Maintain filters, remove debris, and keep fish and plants healthy. For more information, visit [http://www.ces.ncsu.edu/depts/hort/consumer/hortinternet/water\\_gardens.html](http://www.ces.ncsu.edu/depts/hort/consumer/hortinternet/water_gardens.html).

—Craig Mauney

### in this issue

#### COASTAL NEWS

Summer Lawn  
Fertilization

Blossom-end Rot

New Hanover  
County Arboretum

Reducing Inputs

#### STATE NEWS

Gardens of Water

Knock-Out  
Red Rose

Smart Watering

Straw-Bale  
Gardening

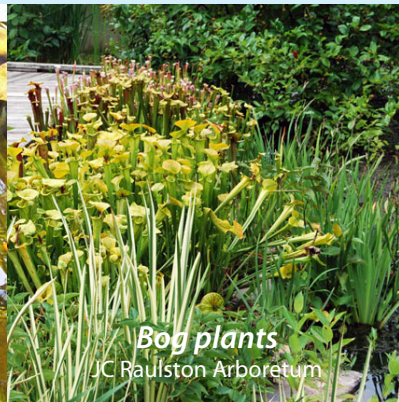
Downy Mildew



**Heartleaf pickerelweed**  
JC Raulston Arboretum



**Ecological balance**  
JC Raulston Arboretum



**Bog plants**  
JC Raulston Arboretum



*Clematis, Ascochyta blight*

(Photo courtesy Janna Beckerman, NCSU Image Library of Plant Problems)



Sibine stimulea  
(saddleback caterpillar)

(Photo courtesy Joe Zobjkiw, NCSU Image Library of Plant Problems)

## Upcoming Events

### Plants, Pests and Pathogens

Televised live the second Tuesday of each month and featuring horticultural agents and specialists from NC State University and the NC Cooperative Extension Service, *Plants, Pests and Pathogens* is your opportunity to stay up to date on the latest horticultural problems and plant recommendations from a variety of NC experts. *Plants, Pests and Pathogens* is televised live at many Extension offices across the state on the second Tuesday of May, June, July and August, from 10 AM to Noon. To find out when and where you can participate, contact your local Extension center.

## Sustainable Gardening — Summer lawn fertilization

Now that spring has sprung and warm-season grasses — such as bermuda, centipede, zoysia and St. Augustine — are flourishing, it is time to begin fertilizer applications. Each type of warm-season grass needs different nutrients, with some needing more than others. It is best to obtain a soil sample before making applications. Soil testing is more accurate than guessing. It eliminates the guesswork and the possibility of applying too much or too little of any key nutrient. If you have not taken a soil test, follow the guidelines below for your specific grass.

For a bermudagrass lawn, after green-up apply 1 pound of nitrogen per 1,000 square feet, every 4 to 6 weeks, from March through August. Examples of a complete fertilizer to use are 12-4-8 or 16-4-8. A little math is needed to determine exactly how much fertilizer to apply to meet the 1 pound of nitrogen per 1,000 square feet. Fertilizer is made up of a ratio of nitrogen, phosphorus and potassium. The first number represents the percent weight of the bag that is nitrogen, the second number phosphorus, and the third number potassium. To determine the amount of nitrogen needed, divide the first

number by 100. So if you were using 12-4-8, you would need to apply 8.3 pounds per 1,000 square feet.

For a centipedegrass lawn, do not apply any fertilizer until mid-June. Centipedegrass lawns need ½-pound of nitrogen per 1,000 square feet of a high potassium fertilizer such as 5-5-15, 6-6-12 or 8-8-24. Typically only one application is needed per year, with exceptions to the coastal areas that may need another application in August to enhance performance. To determine the amount needed per 1,000 square feet, just divide the first number by 50.

For a St. Augustinegrass lawn, apply ½-pound of nitrogen per 1,000 square feet using the same fertilizer recommended for bermuda. Make the ½-pound N application in May, June and August, but apply 1 pound of nitrogen per 1,000 square feet in July.

For a zoysiagrass lawn, apply ½-pound of nitrogen per 1,000 square feet 3 weeks after spring green-up, using the same fertilizer recommended for bermuda. Make another application in late June or early July, and again in mid-August.

—Della King

## Food Production — Blossom-end rot

Tomatoes, squash and cucumbers are summer favorites for eastern NC gardeners. They tolerate our warm weather, are easy to grow and have the potential to generate a lot of fruit from a single plant. This makes them ideal vegetable crops for home gardeners with a small amount of space. However, all of these crops have the potential of developing a disorder called blossom-end rot.

Blossom-end rot is triggered by a lack of calcium in the cell tissue at the blossom end of the fruit. This leads to a breakdown of the cell tissue, followed by secondary fungal infections. The secondary infections are easily managed by simply picking off the infected fruit, but how do we stop the initial onset of the end rot? Controlling calcium is the key. Calcium flows into plant tissues with water that is drawn up by roots from the soil. If this process is disrupted, the flow of calcium stops. Your answer to blossom-end rot? Keep the calcium flowing.

To manage blossom-end rot, maintain the

soil pH at 6.0 – 6.5 with proper lime applications (as indicated by soil test results) and through consistent, deep watering. Maintaining soil pH in the 6.0 – 6.5 range ensures there will be adequate calcium available for roots to absorb.

Deep watering also helps maintain a consistent flow of water from the roots to the new growth. Shallow watering results in plants setting roots too close to the soil surface, which quickly dries out. Applying ½-inch of water two or three times each week encourages plants to set roots deeper in the soil where water volume and soil temperatures are cooler and more consistent.

More detailed information on blossom-end rot in fruiting crops like tomatoes, squash and cucumber can be found online:

**Tomatoes:** [www.ces.ncsu.edu/depts/hort/hil/hil-28-d.html](http://www.ces.ncsu.edu/depts/hort/hil/hil-28-d.html)

**Summer squash:** <http://hgic.clemson.edu>

—Mark Seitz



## Garden Spot — New Hanover County Arboretum

New Hanover County Cooperative Extension started their efforts to develop the Arboretum Gardens in 1985, on the grounds of what had once been Bradley Creek Elementary School. Now (24 years later) the gardens offer enthusiasts a chance to learn in a beautiful and relaxing garden setting. From the beginning, Master Gardeners have been a vital part of the planning, designing, constructing, planting and maintaining of the Arboretum, located at 6206 Oleander Drive in Wilmington. Open during daylight hours, the gardens are free to the public and feature a large water garden that houses a wonderful collection of water lilies; a Japanese tea house nestled in the Japanese Garden; a bountiful vegetable garden where you can collect ideas for your own backyard; a ‘Try a Tool’ shed which features tools and devices that make gardening less stressful; as well as many other theme gardens that showcase good plants for southeastern North Carolina. The gardens



**The Arboretum at New Hanover County includes a children’s garden and a large water garden.** (Photos courtesy JC Raulston Arboretum)

are always changing, and new demonstration trials are planted seasonally. Life today moves at a fast pace. Make plans to stop and smell the roses at the New Hanover County Arboretum and take home some ideas for your garden. Learn more at [www.gardeningnhc.org](http://www.gardeningnhc.org)

—David Barkley

## Environmental Stewardship — Reducing inputs

Can we reduce our reliance on fertilizer, water and pesticides in 2009? Of course we can. Let’s take a look at how we can reduce the need for all three in our own backyards through good plant selection.

Regarding fertilizer, maybe — just maybe — we tend to overdo that in the first place, particularly on mature trees and shrubs. Unnecessary fertilization with nitrogen can increase disease problems and reduce drought hardiness. Landscape plants that have low fertilizer needs include common coastal natives such as Eastern redcedar, live oak, yaupon holly, American beautyberry, devilwood osmanthus, blanket flower and wax myrtle.

Sandy soils are not only low in fertility, they’re also extremely dry. So the coastal plants cited above are also good choices for low water use. Other drought-sturdy natives (or near natives) include Shumard oak, nutall oak, American holly, southern magnolia, longleaf pine

and hickories. Rosemary comes to mind as an excellent drought-tolerant (and low-fertility) herb. Crapemyrtle, ginkgo, camellias, Chinese fringetree and Chinese pistache are tough non-natives to consider for low-input landscapes.

Strategic plant selection is also critical in reducing insect and disease problems in the landscape, which reduces the need for pesticide applications. Some plants are known to have chronic pest problems, and we should limit our use of these plants in the landscape. In addition, we should also strive for a greater overall diversity of plant selection, which will support a more robust beneficial insect population as well as reduce the risk of pest epidemics. When homeowners and landscapers overuse a limited palette of plants, problems tend to crop up over time. Instead, our landscapes should be made up of a wide array of plant species because monoculture and overuse lead to problems.

—Tom Glasgow

# Tips & Tasks

### Ornamentals

- During dry weather, water deeply rather than frequently to promote deeper, more drought-resistant rooting.
- Removing the old flowers from many annuals and perennials will promote the production of new blossoms throughout the summer.
- A 2- to 3-inch layer of pine straw or bark mulch will help reduce weeds and conserve soil moisture in landscape beds.

### Edibles

- Scout vegetables and fruits regularly for problems. Have problems identified by your local Extension agent, and get recommendations for control as soon as a problem begins.
- Most vegetables and fruits require regular watering and fertilization through the summer to keep producing. Many herbs, on the other hand, are very drought tolerant and their flavor diminishes with excess water and nutrients.
- Harvest vegetables regularly to keep up production.
- Mulch vegetables and fruits with straw, old leaves or aged bark to help control weeds and hold moisture in the soil.

### Lawns

- Mowing regularly and at the correct height will promote dense turf and help reduce weed problems. Centipede, bermuda, and zoysia grasses should be mowed at a height of 1-inch, while St. Augustine should be mowed at 3 inches.
- Leave clippings on your lawn — they return nutrients and moisture to the soil and do not contribute to thatch buildup.

—Charlotte Glen





JC Raulston - W. Robertson

## Showstopper — Knock-Out® Red Rose

For years disease-resistant roses have been on the market only to disappoint Southern gardeners. Well, look no further because the Knock-Out® Red Rose (*Rosa hybrida* 'Radrazz' – PP #11836) has the grit to withstand our hot, humid Carolina weather. This exciting rose cultivar is a shrub rose that grows about 3 feet tall and wide. As the weather warms, 3-inch diameter cherry-red blooms appear as terminal clusters of single flowers. As long as the plants continue to grow through spring, summer and fall, this rose will continue to flower. Like nearly all roses, Knock-Out® Red Rose performs best in full sun with fertile, well-drained soil. Prune during the growing season on an “as-needed” basis to control plant size. Water during periods of drought to maintain a continual supply of flowers.

Chosen in 2000 as an All-America Rose Award winner, this 2009 Showstopper Plant is **truly** a knock-out!

—John Vining

## Incredible Edibles

Straw-bale gardening saves space but requires more attention to watering and nutrients than traditional gardening. Vegetables that grow well in bales include lettuce, tomatoes, cucumbers, squash and eggplants. Condition straw bales 10 days before planting. Place each bale at its growing location in full sun and on edge to keep the string from touching soil. Soak the entire bale for 3 days by slowly watering it. Over the next 5 days, add a high nitrogen fertilizer (such as 33-0-0) at 1 tablespoon per day and slowly wash it in. On day 9, add a complete fertilizer (17-17-17, 10-10-10 or 19-19-19) and water again. Plant on day 10 and water again. One bale can hold 2 tomato plants, 6 cucumbers or 2 to 3 squash. A soaker hose will save time. Wilting indicates the need for watering.

—Don Breedlove



[www.ces.ncsu.edu](http://www.ces.ncsu.edu)

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## Sustainability

### Practice Smart Watering

Watering plants in the landscape too much or too little causes many plant problems. Over-watering causes more damage than under-watering. To have healthy plants, save money on water bills and conserve precious drinking water, use these tips. Water plants deeply, but infrequently, so that the soil dries between watering. Wait until grass turns gray or leaves fold before watering lawns. Let annuals, perennials, herbs and vegetables wilt slightly before watering. To make every drop count, build garden areas with compost and use mulch to conserve water. Choose low-water-use trees and shrubs that can thrive on rainfall alone once established. Use soaker hoses or drip irrigation. You should water in early morning to reduce water loss from evaporation. Finally, use rain barrels and rain gardens to reduce drinking-water use and hold water on site.

—Danny Lauderdale

## Pest Alert — Downy mildew

In late summer agents start to receive samples of downy mildew on muskmelon and cucumbers. This disease can cause a lot of damage quickly. Cucumber and muskmelon are the cucurbits most susceptible to downy mildew, but it may also attack melons, squash, pumpkins, gourds, and other members of the Cucurbitaceae family.

Symptoms first appear as small, angular, yellow lesions on the upper side of the leaf. A white to purplish mildew may be observed on the lower side of the leaf during humid weather. As the lesions expand, their centers turn brown. Often the margins of the diseased leaves curl upward. During favorable weather leaf lesions coalesce, killing large areas of the leaf surface. This results in a stunting of the plant and a failure of the fruit to mature properly. Even fruit

that reach maturity may have an off-flavor. In severe cases, the entire plant will die.

The fungus requires extended periods of wet weather and leaf wetness for the infection. Several cucumber varieties are resistant to downy mildew, but watermelon and muskmelon varieties are not. Control of downy mildew depends on cultural practices, early detection and timely applications of fungicides. Early detection is essential for the proper control of foliar pathogens. If weather conditions become favorable for the development of downy mildew, begin protective fungicide applications and continue on a 4- to 7-day interval. Look for fungicides containing the active ingredients mancozeb or chlorothalonil.

—Karen Neill



**Downy mildew on a cucumber leaf** (Photo courtesy ©G.C. Holmes, NCSU)