Lawn Impacts on Trees

Researchers at Kansas State University (including a graduate of the doctoral program at NC State’s Department of Horticultural Science) have proven something that many of us have observed for years: grass inhibits the growth of trees. Landscapers and home gardeners have long noticed this phenomenon that seems rather obvious when there is opportunity for comparison. But the research data shows that the negative impacts of grass on tree growth is far greater than what we can observe.

The work published in HortScience, vol. 42(2) April 2007 compared the establishment and growth of eastern redbud and pecan trees sharing space with three species of grass as well as treatments without grass that were mulched or maintained as bare soil. Plots were prepared uniformly then planted with grass, mulched, or left bare. Grasses were tall fescue, Kentucky bluegrass, and hybrid bermudagrass. Grasses were planted and allowed to establish. Then the trees were planted into all plots.

Growth was measured 9 and 17 months after trees were planted. After 17 months trees were removed for more data collection including weighing of harvested roots and dried leaves. Other data collected included amount of photosynthesis and nutrients within the plant tissue.

Experienced growers will not be surprised to learn that by the middle of the first growing season leaf size of trees grown in bare soil or mulch was visibly larger. Shoot growth of redbuds grown in grass plots stopped by mid-July; for those in bare soil or mulch shoot growth continued into October. Leaves of both trees grown in grass plots were visibly yellow compared to those grown in mulch or bare soil.

After two growing seasons, measured trunk diameter of redbuds grown in mulch or bare soil was about twice the diameter of trees grown with fescue or bluegrass. Pecans growing with fescue or bluegrass also had the smallest trunk caliper.

Shoot growth was significantly greater for redbuds grown with mulch or on bare soil. A calculated growth index (average of height and widths measured in two directions) showed that all grasses significantly reduced total growth of redbuds. Pecan trends were similar but less pronounced.

Perhaps the most significant growth difference was seen in the roots. Roots of both trees were 4 to 5 times greater for
and that those products run off into surface waters and contribute to reduced water quality. And they are accused of using more than their share of water. Sometimes these accusations are true. But it’s not the fault of the lawn; it’s just poor management. It’s also true that many trees and shrubs are also over fertilized, over watered, and over sprayed. Again, that doesn’t make them bad landscape choices, but it may be bad management.

Perhaps it’s not obvious, but fertilizers and pesticides that leave the lawn, don’t do the lawn any good. And it’s possible to have a very lush lawn that is managed organically. (For more on the organic lawn visit http://www.turffiles.ncsu.edu/PDFFiles/004494/Organic_Lawn_Care_AG562.pdf or contact your local Extension office for a copy of Organic Lawn Care.) And excess water causes problems for lawns just as it does for other plants. The lawn is not to blame!

It’s also widely understood that grasses are an important component in protecting water quality. A standard suggestion for buffering streams is to provide both a strip of woody plants plus a strip of grass. Both of these serve the role of slowing water runoff and filtering out nutrients (fertilizers) that may be in the water. Most grasses are very efficient at using fertilizer nutrients and keeping them out of surface water. On the other hand, we don’t encourage anyone to fertilize any plants right up to the water line. A good rain can wash fertilizer into streams before plants have any chance at it.

Want to have your lawn and be environmentally sound? Want to be green both aesthetically and environmentally? It’s all possible. Following are a few guidelines for maintaining your lawn in “green” manner.

Use fertilizer as part of a total management plan. Don’t use fertilizer as “medicine” for solving problems. Grasses need small amounts of fertilizers on a regular schedule to do their best. Dense, healthy grass does a better job of slowing runoff and reducing soil erosion (a cause of red muddy streams after a heavy rain). Each type of grass performs best on a specific fertilizer schedule. Look for guidelines for your grass type at http://www.ces.ncsu.edu/chatham/ag/homehort/homelawn.html

Remove any fertilizer from hard surfaces. Runoff from walks and drives goes to streams and lakes. Keep it clean.

Mow the grass at its proper height. Fescue should be mowed at 3 inches or higher. During the heat of summer, raise the mower as high as it will go. Warm season grasses (bermuda, centipede, and zoysia), should be mowed at 1 inch. Each of these grasses will provide a denser cover and will restrict runoff better at its optimal mowing height. They will also compete better with weeds at the recommended mowing height. Mow often enough that you don’t remove more than 1/3 of the grass height.

Practice Grasscycling. Grasscycling is simply returning the clippings to the soil. By leaving the clippings you recycle fertilizer nutrients and add organic matter back into the soil. Grass clippings do not cause thatch. The only time to remove clippings is if mowing is delayed and you have enough clippings to smoother the grass. Even then you may be able to spread it adequately with a leaf rake the day after mowing.

Water deeply but infrequently. You may need to probe the soil to
Compost: A Living Thing

I’m not sure I understand all the mystery about composting. It’s a natural process that will occur whether we participate or not. When living material dies, it rots. In fact, it would be difficult to stop the process of composting. Some people actually practice what is called “sheet composting” by which vegetative material is simply broadcast on the surface of a garden soil and allowed to decompose there naturally. Good for the soil and better than sending the stuff to the landfill.

What we can do is speed it up or slow it down. And maybe that’s what the mystery is about. To understand the speed of composting we need to stop and realize that stuff doesn’t just rot or decompose. What we call decomposition is actually the use of the material by other organisms for their life processes. These organisms include insects and earthworms as well as bacteria and fungi. And what we do to speed up composting is basically creating optimal environmental conditions for these organisms to do their jobs.

So what do they need? They need something to feed on, air, water, and optimal temperature.

Something to feed on
This substrate on which organisms of decay feed includes most of the kitchen and yard or garden refuse that we seek to recycle. Yard waste may be leaves, grass clippings, straw, or plant trimmings (but keep the woody portions to a minimum). Most kitchen wastes can be added. Some composters prefer to omit meat products that may create unpleasant odors and/or attract animals to your compost pile. It’s not a bad thing for animals – wild or domestic – to dig through your compost pile, but there may be reasons not to attract these animals to your backyard. You make the call.

Other materials that you may add to a compost pile include animal manures, plant debris from the vegetable or flower garden, and hay. Woody material such as plant stems or branches and sawdust can be used but may require the addition of extra nitrogen. Scientists know that the ideal carbon to nitrogen ratio (C:N) is about 25 to 30 parts carbon to 1 part nitrogen. Most of us have no way to measure that. Just be aware that woody material is mostly carbon with little to no nitrogen. Extra nitrogen can be supplied with any garden fertilizer that contains nitrogen. Or you can add organic materials containing nitrogen – dried blood, cottonseed meal, fish scraps, soybean meal, grass clippings, and most manures.

Particle size of materials added can affect the rate of decomposition. Particle size simply affects the amount of surface area that decomposers have access to. If you add a tree limb it will gradually decompose. If you run the same tree limb through a shredder, there is more surface area exposed to decaying organisms. Add some nitrogen, and you will speed up the whole process. Large leaves may compost more rapidly if shredded with a mower first.

Air
Air (specifically oxygen) is essential for the decomposers. Some decomposition can occur without it. Such anaerobic decomposition is slow, however, and can produce foul odors. Simply turning the pile once or twice a month will usually expose the components to air and provide the necessary oxygen to speed up the composting process. We’ll get to containers used for compost piles. For now let’s just say that turning the pile can be done by emptying the contents on the ground and using a pitch fork to put it back in. Or use the fork to just move the contents of the pile from one place to another.

Water
Living things need water. If the compost pile is exposed to rainfall, that may be adequate most of the time. If the pile is covered or if rain is limited, you may need to add water occasionally. Large amounts of kitchen waste may provide sufficient water. If you add water, you should completely moisten the pile throughout. But don’t overdo it. The pile should not be soggy. If water displaces the air in the pile the process slows and may begin to produce those odors we mentioned before. If the pile is wet and smelly, you probably need to get out the pitchfork.

Putting it all together
You can purchase fancy containers for your compost. They may have cranks to turn and aerate the compost and doors for allowing it to fall out the bottom. Or you can pile the compostable materials on the ground and manage it with a pitchfork. Either approach will work. For large amounts of raw materials, you may need to go with an open pile or build a crude means of containing it.

Compost can be confined with poultry fencing. Or you can salvage some shipping pallets to form sides and bottom. Volume and appearance are largely a matter of personal preference and convenience. Most of

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Compost: A Living Thing

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them will work fine if you remember the raw materials we have discussed. If you would like to see some pictures, there are some available at http://www.ces.ncsu.edu/depts/hort/hil/hil-8100.html It’s a whole leaflet on composting (available on request) that will give you a bit more detail and the pictures!

Locate the pile away from wells and surface water. Even though you may have added all natural materials, nitrate is one of the natural forms of nitrogen and, being water-soluble, can move into ground water or surface water. In ground water it becomes a health hazard and in surface water it becomes an environmental hazard. And keep the pile away from trees. Tree roots can and will grow up into a compost pile and make it very difficult to separate.

Compost is usually started by creating a layer of coarse material such as leaves or straw several inches deep topped by an inch or two of finer material such as grass clippings or manure. Be sure there is a nitrogen component, and then repeat layers. Add water and give it some time. How much time?

Temperature

No, we can’t forget temperature. Temperature and time work together. Remember again that we are dealing with living organisms and biological processes. Biology happens more rapidly as temperature increases and more slowly as temperature decreases. You can expect more rapid decomposition in summer than in winter. And the decomposition process itself will generate heat. For some reason, the optimal size of a pile for heat generation seems to be about 5 feet high by 5 feet wide.

Use this as a guide but don’t let it limit you. Remember it will all break down eventually. It’s just a matter of time.

An actively decomposing pile will reach optimal temperatures of about 140° to 150° F. This temperature is sufficient to destroy many weed seeds, plant pathogens, and some insects, but allows the decomposing organisms to continue their work. If it gets much hotter than that, some decomposers are killed and the process slows down. For this reason, commercial composters monitor temperatures and aerate the pile to avoid getting too hot.

Can I add …?

That brings me to the question of whether it’s OK to add weeds or diseased plants to the compost pile. I usually answer that question with a question: how well do you manage the pile? If you are balancing the C:N ratio, turning the pile to aerate it often, and making sure it has sufficient moisture, then there is a good chance that the temperature will get over 140° and stay there for a few days. In that case you can add things like weeds or diseased plants that will likely be destroyed in the process.

BUT… Throughout this article, I’ve maintained that the compost will happen even if you don’t worry too much about it. And frankly, most of us don’t worry too much about it. We add stuff as we get it, turn it or water it occasionally and take what we get. For that compost pile, I don’t encourage the addition of diseased plant material, perennial weeds, or any weed seeds. Unless you are managing the compost well, there’s a good chance these materials will not be destroyed. So, how well do you manage the pile?

Using the compost

Contrary to popular opinion, compost does not tend to be high in plant nutrients. There are some there, and compost may supply all you need of many of the micronutrients. It may not be an adequate source of things like nitrogen, phosphorous, and potassium. Compost does help hold, in the soil, nutrients that otherwise might be leached out.

The real value of compost is its contribution to soil structure. It helps to create soil aggregates improving both drainage and water infiltration and retention. (Sounds like magic!) It also improves the soil environment facilitating the life of microorganisms in the soil. These microorganisms, referred to as the Soil-Food Web, continue to enhance soil structure.

Compost introduces a community of living things into your soil. For a lot of our soils, that’s a missing element, especially for soils that have been abused by housing construction activities.

Things You Might Wish You had

Paid Attention To

While gardeners have enjoyed all the changes of spring, there are some downsides that we sometimes ignore at our peril. For while plants are recovering from a dormant season, other living things are also awakening. Some of them are phytophagous – they feed on plants!

Lacebug: You can find live adult lacebugs just about year round here. But as the azalea or Rhododendron flowers fade and new growth begins, lacebug eggs start hatching. Just as you can distinguish fresh produce in...
Things You Might Wish You Had Paid Attention To

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the season these products are less effective and it takes more toxic materials to be effective. And of course, hand picking is always an option.

Fire ants: Fire ants forage in warm (not hot) weather. Watch for mounds that look like they have been renovated with fresh soil. If they are in areas likely to cause problems of people contact, drop a potato chip or piece of hot dog a foot or two from the mound in the afternoon. If they are actively foraging, you'll find them feeding on the "bait" in less than an hour. If they are taking the bait, it's a good time to bait them with an appropriate fire ant bait. If the ants are not lured to an oily potato chip, they probably won't take the more expensive bait either. Be sure to select bait products suitable for use on the site. Read the directions and follow them exactly. And be patient. Slow control is more long lasting. The strategy is more important than the product. Use baits on warm afternoons when the ants are actively foraging. Avoid use under damp conditions. Keep the bait fresh and in an airtight container. And don't wait for the temperature to go into the 90s. Fire ants do more foraging when it's below 85 F.

Leaf Gall: These galls on azalea or Camellia consist of thick fleshy tissue that is pale compared to normal leaves. It is more alarming than serious. Pruning and removing infected stems is generally the most effective control strategy. You may find more of it depending on the spring weather. But it's not a serious threat to the plants.

Fire Blight: Pears, apples, and crab-apples are especially susceptible to this bacterial disease that may affect any member of the rose family. The bacterium is often introduced by pollinating insects. Some years it's worse than others, somewhat affected by the weather during pollination. Affected shoots will first appear water soaked followed by wilting. Eventually the leaves turn brown or black and remain on the stem. The bacterium continues to grow down the stem if not removed. Prune at least a foot below any sign of injury. Sterilize pruners with a solution of 1 part household bleach to 9 parts water between cuts. Continue to monitor the plant for further signs of disease and prune as needed. There is no product that can cure these infected stems, which will get worse if left unattended.

Fruit Rots: With damp spring weather following the bloom period of fruit trees, we can expect rotting pathogens to set in. Often these fungi are transferred to the new fruit from infected flowers or from cankers on the tree. The fruit is infected soon after formation, but the rot is not obvious until much later in summer. The most effective way to avoid these rotting pathogens involves a complete IPM (integrated pest management) strategy that includes site selection (full sun, good air movement), pruning (to enhance light penetration and air movement), and preventive fungicide sprays begun after the flower petals fall. Fungicides will not cure the problem later and must be applied prior to infection.

For more information on these pest problems, see the following websites on the next page or contact your Extension office.
Things You Might Wish You Had Paid Attention To

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Lacebug –
http://www.ces.ncsu.edu/depts/ent/notes/O&T/shrubs/ort039e/ort039e.htm
Bagworms –
http://www.ces.ncsu.edu/depts/ent/notes/O&T/trees/ort081e/ort081e.htm
Fire Ants –
http://www.ces.ncsu.edu/chatham/ag/homehort/fireants.html
Fire Blight –
Disease and Insect Management in the Home Orchard –
http://www.ces.ncsu.edu/depts/pp/notes/Fruit/fdin002/fdin002.htm

Take the Bite Out of Ticks

Anne Lowry, Chatham County Public Health Department

Living in North Carolina, most people who garden, play, or work outside will eventually encounter ticks. Ticks are arachnids that can attach to humans and animals and transmit disease organisms that cause Rocky Mountain spotted fever, Ehrlichiosis, Southern Tick Associated Rash Illness (STARI) and Lyme Disease. These diseases can be treated if detected early; however, if untreated they can lead to long term illnesses and, in some cases, death. Luckily, there are simple steps to follow to prevent ticks from attaching to your body:

Use Tick Repellent. The Centers for Disease Control recommends using a repellent with 30% DEET (on skin or clothing) or permethrin (only on clothing) to help deter ticks from attaching to the skin or clothing. (Do not use the 30% product on children without consulting a physician. Applications to children should be made by an adult to avoid getting the product on children’s hands.)

Dress for Ticks. When walking in the woods, wear light colored clothing, long sleeves, and long pants. Put your pants legs into your socks.

Check yourself, your kids, and your animals for ticks when returning from being outdoors. Be especially watchful around the waist, the groin, and the neck.

Don’t forget to check your clothing as well for ticks.

If you do find a tick remove it immediately taking the following steps:

Use fine tipped tweezers and protect hands with a tissue or gloves to avoid contact with tick fluids.

Grab the tick close to the skin. Do not twist or jerk the tick, as this may cause the mouthparts to break off and remain in the skin.

Gently pull straight up until all parts of the tick are removed. After removing the tick, wash your hands with soap and water (or waterless alcohol-based hand rubs when soap is not available).

Clean the tick bite with an antiseptic such as iodine scrub, rubbing alcohol, or water containing detergents.

Identify the tick, if possible then dispose of it. You may save the tick in case you later start having symptoms of disease and need to know what kind of tick bit you. Put the tick in a clean, dry jar, small plastic bag, or other sealed container and keep it in the freezer. Identification of the tick may help your provider diagnose and treat your symptoms. If you do not have any symptoms of disease after 1 month, you can discard the tick.

Remember to document the date that the attached tick was found and where it was located on the body.

If you experience headache, fever, chills, aches, pains, or rash within 30 days of removing the tick, consult a physician immediately. The physician will prescribe an antibiotic to treat the infection; he should also take a blood serum test if he suspects that you have a tick-borne illness. The antibiotics should act quickly to relieve the symptoms and combat the disease causing organisms.

*Exposure is defined as having been in potential tick habitats within the past 14 days before onset of symptoms. A history of a tick bite is not required.

If you are diagnosed with a tick borne illness, please encourage the doctor to take a blood serum sample to determine the disease causing organism. The state of North Carolina considers the illness to be a probable tick-borne illness if you have acute clinical symptoms and your blood sample tests positive. To become a North Carolina reportable confirmed tick borne illness case in some instances, you will need to return to the doctor for a second blood serum test, (depending on the testing method used). Without confirmation, the Chatham County Public Health Department is unable to account for all tick-borne illnesses that may be occurring in the community. If the public health community does not have true numbers of tick-borne illnesses, setting public health priorities related to ticks is very difficult.

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Lawn Impacts on Water Quality

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see how deep the roots are growing. That’s how deep you need to water. Water only when the lawn shows signs of stress. Look for a slight change of color near hard surfaces such as a wall or drive as a sign of water need.

Diagnose problems before applying solutions. Don’t spend a lot of time, energy, money, and products just trying things. Fertilizer won’t cure insect problems, and insecticides won’t solve disease problems. If you don’t know what’s wrong, get help to figure it out.

Evaluate and renovate the lawn if needed. Fescue should be evaluated in August. If it is thin or weedy, plan on a light overseeding after Labor Day. Warm season grasses should be evaluated about late May. In both cases, the grass has a long growing season ahead and time to fill in. Be proactive in working with the growing season so that you won’t have to react to problems.

The lawn can be an eyesore or a source of pleasure. If you don’t like lawns or lawn maintenance, it’s fine to do something else. Just do it well so that you minimize runoff and soil erosion. And if you go to the park and spread a blanket on the grass, you’ll admit that grass can have a few benefits.

Take the Bite Out of Ticks

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For example, Chatham County had 84 Rocky Mountain spotted fever reports in 2007, only 48 patients met case definition for probable, but only one patient returned to have a second blood serum test to have the illness confirmed. This shows that, even though Chatham County may have more cases of Rocky Mountain spotted fever, we can only report one incidence of the illness. Demonstrating the level of illness in a community with confirmed cases helps set funding priorities for educational resources and prevention activities to help combat the disease.

The most common illness reports in Chatham County are for Rocky Mountain spotted fever. Rocky Mountain spotted fever is caused by a bacteria-like microorganism, Rickettsia rickettsii. The microorganism, carried by the American Dog Tick, is not harmful to most wild and domestic animals, but they are extremely harmful to humans and dogs. Luckily, very few American dog ticks carry the Rickettsia rickettsii bacteria. The symptoms of Rocky Mountain spotted fever include headache, fever, chills, aches, pains, and are usually accompanied by a rash starting at the wrist and ankles. It is important to note that Rocky Mountain spotted fever can infect the same person more than once.

Lyme Disease is still primarily a disease in the northeastern and north-central United States and is transmitted by the black-legged tick or deer tick. No studies have shown that other ticks carry the causative agent of Lyme Disease, Borrelia burgdorferi. The first sign of Lyme disease in 60-80% of people is a circular rash called Erythema migrans, commonly described as having “bull’s eye” appearance. The rash generally appears 3-30 days after the tick bite. The illness may also include fatigue, chills, fever, headache, swollen lymph nodes and muscle and joint aches. If treated early, most cases of Lyme Disease are successfully treated with antibiotics. If the disease is not treated some cases can result in severe reactions including arthritis, joint pain, and swelling.

For more information about ticks and tick borne illnesses please visit http://www.cdc.gov/niosh/topics/tickborne/.
Green Thumb Prints by Email

Do you want to receive your issue of *Green Thumb Prints* quicker and without having to check your mailbox? You can elect to receive your newsletter by email. Just send an email to susan_s_graham@ncsu.edu and ask that you be taken off the US Mail list and added to our electronic email list. We’ll send you an email with a link to the latest edition once it’s posted to our website, which is usually a week before the hard copies go out.
Butterflies in the Garden

Who hasn’t paused to admire a butterfly flitting about the garden? And perhaps you thought you would like to have more of them. There are a few simple steps you can take to make your gardens more attractive to butterflies.

**Diversity.** The more variety you have, the more likely you are to attract different types of butterflies. Select variety in plant size and shape, flower color, flower size and shape, and bloom time. Remember that you’ll need some plants for the larvae (caterpillars) to feed on as well as nectar plants for the adults.

**Design.** Butterflies are most active in sunny areas and many plants will require full sun. Provide some flat rocks for basking in the sun. Group plants with similar blooming periods to provide easy access for butterflies. But include plants that bloom at different times. Give plants adequate space to grow and expand. Leave some low, damp, muddy areas for the male butterflies to ingest salts.

**Maintenance.** Butterflies tend to like it a little untidy. Avoid deadheading, or at least leave some of them. Spent flowers or stems may harbor eggs or pupae waiting in line to become butterflies.

Following are some plants where you may find butterflies or their children:

<table>
<thead>
<tr>
<th>Shrub</th>
<th>Perennial</th>
<th>Annual</th>
<th>Caterpillar Host Plant</th>
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<tbody>
<tr>
<td>Buddleja spp.</td>
<td>Asclepias tuberosa</td>
<td>Antirrhinum majus</td>
<td>Anethum graveolens</td>
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<tr>
<td>Lindera benzoin</td>
<td>Caryopteris x clandonensis</td>
<td>Cosmos spp.</td>
<td>Asclepias spp.</td>
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<td>Rhododendron spp.</td>
<td>Coreopsis spp.</td>
<td>Impatiens wallerana</td>
<td>Asimina triloba</td>
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<td>Digitalis purpurea</td>
<td>Petunia x hybrida</td>
<td>Aster spp.</td>
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<td>Echinacea purpurea</td>
<td>Tagetes spp.</td>
<td>Cirsium vulgare</td>
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<td>Eupatorium fistulosum</td>
<td>Verbena spp.</td>
<td>Daucus carota</td>
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<td>Helianthus spp.</td>
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<td>Foeniculum vulgare</td>
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<td>Hemerocallis spp.</td>
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<td>Hibiscus spp.</td>
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<td>Passiflora incarnata</td>
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<td>Ruta graveolens</td>
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<td>butterfly bush</td>
<td>butterflyweed</td>
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<td>bluebeard</td>
<td>Asclepias spp.</td>
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<td>coreopsis</td>
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<td>foxglove</td>
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<td>purple coneflower</td>
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<td>Joe-Pye-weed</td>
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<td>daylily</td>
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