LSU AgCenter
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5 Acres or Fewer Farms News

Spring 2019

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Cover photo:
Chantelle Mushrooms from Pontchartrain Mushrooms

Spring Vegetable Garden Must Do's

By: Dr. Kiki Fontenot LSU AgCenter Vegetable Specialist

Paying attention to the local forecast is extremely important in early spring. Technically our average last freeze dates are March 15 for south Louisiana and April 1 for North Louisiana. However, there is always a chance that a freeze or frost may occur after these dates. Crops grown in the spring season are not tolerant of low or freezing temperatures. Really pay attention to the local forecast. Make a sound decision on planting at the estimated date listed above or waiting a bit longer. The last thing you want to do is start off the season on a bad foot and lose all of your tomatoes or cucumbers to a late freeze. Been there, done that... It is one thing to lose a crop to something out of your control but losing a crop to impatience is never fun.

Silver Queen White Sweet Corn

Vegetables to Plant in March

Direct plant snap bean, Swiss chard, radish, lettuce, collard, mustard, turnip and sweet corn seeds into the ground. Plant tomato, pepper and eggplant transplants after March 15 in south Louisiana and April 1 in north Louisiana. Cantaloupes, squash, cucumbers and watermelons seed and transplants need warmer soils to perform their best. Make sure all frost are over before planting these. Technically, you can use the same dates given for other crops (March 15 and April 1), but to be on the safe side, you might wait a week or two extra for cucurbit crops.

... and in April

Plant snap beans, butter beans, radish, collards, cucumber, eggplant, cantaloupe, okra, Southern peas (field peas), peanuts, pumpkin (for a really early harvest), winter squash, summer squash, sweet corn, sweet potatoes (plant roots in late April), tomatoes (transplants), peppers (transplants) and watermelon. Remember that most pumpkins require 90-120 days to reach full maturity, and some giant pumpkins may even require up to 160 days before they are ready to be harvested. These days must all be frost-free. If you are aiming to harvest pumpkins at or a little before Halloween, adjust your planting date according to the variety of pumpkin you are planting. Typically small to medium sized pumpkins are planted late-June to the first week of July for a Halloween harvest. Read the seed catalogues and seed packages and figure the date you should plant that pumpkin based off of when you want to harvest it. Okra lovers mid-April is the earliest time I would plant this crop. Make sure the soil is warm. Planting early simply stresses okra.

... and in May

Most spring vegetables can be planted in May, since the soil has warmed and danger of frost has passed. Plant sweet potatoes (cut vines or "slip" that grew from the potato piece you planted in April), okra, Southern peas, pumpkin, peanuts, sweet corn, watermelon, cucumber, butter beans, squash, cantaloupe, collard and eggplant (transplants). Snap beans, butter beans, sweet corn, tomatoes and peppers (transplants) should be planted in the early days of May to prevent poor fruit set as a result of high temperatures. Sweet corn seed should also be planted early as worm control becomes more difficult as the season progresses.

Crop Highlights

Sweet corn. Planting corn early may reduce exposure to corn earworm populations. The earliest planting should be made seven days before the average last

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frost date for your area. Plant every two to three weeks to provide a continuous supply of sweet corn. Remember to plant the same variety in a block of at least three rows side by side at each planting. This will help ensure good pollination and well-filled ears. Planting a yellow corn adjacent to a white corn in small gardens may cause bicolor corn ears to form because of cross-pollination. To avoid cross-pollination, wait 3 weeks between planting varieties. When planting sweet corn, drop two or three seeds every 8 to 12 inches in the row and cover to about ½ inch to 1 inch deep. After the seeds germinate and the plants are 3 to 4 inches tall, thin to one plant per hill. Side-dress a 100-foot row with 1½ to 3 pounds of calcium nitrate when the plants are about 12 inches tall and again when the plants are 24-36 inches tall. One pint of fertilizer or 2 cups is about 1 pound. Three ounces of seed will plant 100 ft. row. Dust or spray silks with Sevin every two to three days after silks first appear and until silks begin to dry. This treatment will help reduce corn earworm damage. Harvest sweet corn early in the morning while it is still cool. Chill or cook immediately after harvesting. Sweet corn that is ready to harvest should have a well-filled ear. Kernels should be bright and plump, and their juice should be milky.

Celebrity Tomato

Varieties such as Seneca Horizon, Funks G90, Gold Queen, Silver Queen (white) and Golden Cross Bantam perform well. Many other varieties are available and do well in Louisiana. Give Ambrosia, Incredible, Miracle and Delectable a try as well as Temptation, Obsession, Honey and Cream, Peaches and Cream, Luscious and any of the XTRA-Tender numbered series.

Snap beans. Plant bush varieties every two weeks, starting right after the average last frost date. This will provide a continuous harvest for an extended period. One-half pound of snap bean seeds will plant a 100-foot row. Plant seeds 1-2 inches apart in the row. High temperatures at bloom may cause many of the flowers to fall off. Generally, snap beans do not produce well when planted in late May. For best quality, harvest pods before the developing seeds cause the pod to bulge. Beans can be held for up to seven days at 40-45 degrees Fahrenheit and 90-95 percent humidity.

Pole snap bean varieties produce larger yields since they produce for a longer period than bush varieties. Space seeds about 6-12 inches apart. About 2-3 ounces of seeds will plant a 100-foot row. For pole snaps, the All-America Selections winner is Kentucky Blue. Rattle Snake and McCaslan have done well in Louisiana. For those who want a bean that sets well in the heat, try the vigorous Yardlong Asparagus Bean and harvest pods when 12-18 inches long.

Tomatoes. Plant tomatoes in a well-drained site that receives six to eight hours direct sunlight. If the garden is too shady, few blossoms form and many of those that form fall off before setting fruit. Begin transplanting in mid-March in south Louisiana and at or after April 1 in north Louisiana – after the danger of frost is over. If a frost occurs, you will need to cover the newly planted plants! Early blight is a common disease in tomatoes. Spray with copper fungicides early in the season at the base of the plant. Switch over to garden herbicides later in the season. Scout weekly for insects. Space tomato plants 18-24 inches apart. Fertilize with 6-7 pounds of 13-13-13 per 100-foot row prior to planting and side-dress at first and second bloom with calcium nitrate or potassium nitrate. Tomato vines may be determinate or indeterminate. Indeterminate types have a vegetative terminal bud that

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continues to grow. Determinate types have a fruiting terminal bud that keeps the plant from growing beyond a predetermined height. Determinate types are better suited for container gardening. Indeterminate types will need to be staked in the garden. Indeterminate varieties that grow well in Louisiana include Better Boy and Big Beef (large); Champion and Pink Girl (pink); and Sweet Million, Sweet Chelsea, Jolly, Small Fry, Juliet, Elfin, Cupid, Mountain Belle and Sun Gold (cherry). Determinants have very productive vines that grow to heights of 4 feet. Determinants should be pruned only once or twice up to the first cluster. Recommended determinate types for Louisiana include Celebrity (an All-America Selections winner, best taste); Carolina Gold, Florida 91, Mountain Spring, Cherry Grande (cherry) and Floralina. Also try Sun Master, Sunleaper, Mountain Spring and Phoenix.

Note: The tomato spotted wilt virus has nearly eliminated tomato production in some areas. If you had trouble with it, plant Bella Rosa, Mountain Glory, Amelia, Quincy, and Fletcher varieties.

Calliope Eggplant

Bell pepper, eggplants and okra. Wait to transplant or direct seed okra, bell pepper (transplants) and eggplant (transplants) until the weather has warmed considerably. These vegetables are sensitive to cold soils and weather. Once stunted by cool weather, they recover slowly. A garden site with full sun is required for growing bell peppers. Any shade will greatly reduce fruit set. Space peppers about 18 inches and eggplants 18-36 inches apart. Okra should be spaced 12-36 inches apart depending on variety.

Recommended open pollinated varieties of bell peppers include Capistrano, Jupiter and Purple Beauty. Recommended hybrid bell peppers are Revolution, Heritage and the large King Arthur, Valencia, Paladin and Plato, Camelot (X_3R), Aristotle, Gypsy, Tequila (purple) and Mavras (black). *(Note: Tomato spotted wilt virus has hindered bell pepper production in many areas.)* The varieties Stiletto, Patriot and Excursion II are resistant to tomato spotted wilt virus. Try these varieties if you have had trouble producing bell peppers.

Recommended hybrid eggplant varieties are Fairy Tale, Calliope, Classic, Epic, Dusky, and Santana. Green eggplant varieties produce well in Louisiana and are less bitter than the purple varieties in hot, dry weather.

Cucurbits. Plant cucurbits outdoors well after the danger of frost is over. Do not keep transplants in pots longer than three to four weeks prior to planting in your garden.

Recommended cucumber varieties:

Slicing are Dasher II, General Lee, Thunder, Speedway, Poinsett 76, Slice More and Intimidator.

Pickling, try Calypso, Fancipak, Jackson and Sassy.

Summer squash crooknecks are Prelude II, Dixie, Gentry, Goldie, Supersett, Destiny III and Medallion.

Yellow straight-neck squash varieties are Goldbar, Liberator III, Enterprise, Cougar, Multipik, Patriot II, Superpik and Fortune

Zucchini varieties are Justice III, Independence II, Tigress, Lynx, Spineless Beauty, Senator, Gold Rush (AAS) and Payroll.

Scallop or patty pan squash varieties are Peter Pan and Sunburst.

Hard shell (winter) squash varieties are

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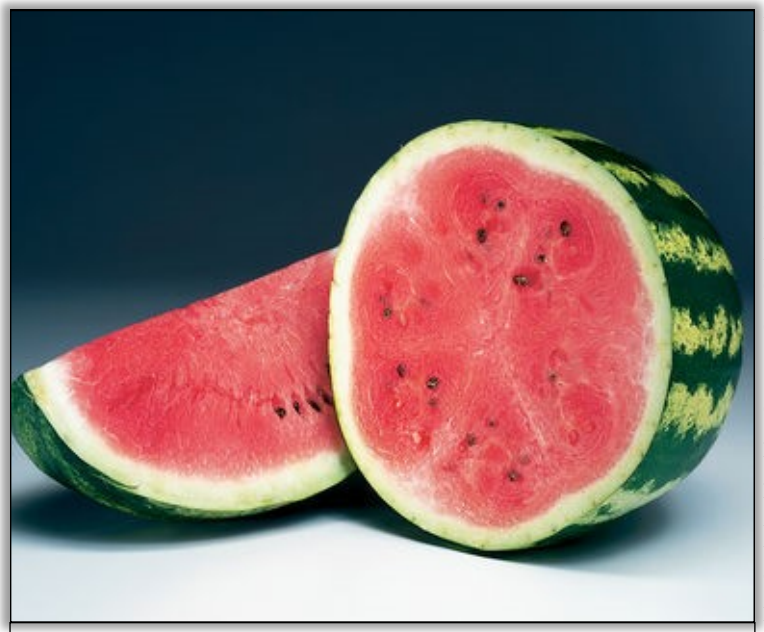
Waltham Butternut, Butternut Supreme, Early Butternut, Tay Belle Table Queen, Honey Bear, Cream of Crop, Table King and Imperial Delight.

Cantaloupe varieties are Ace, Aphrodite, Athena, Primo, Magnum 45, Super 45, Ambrosia, Earlidew (honeydew type) or Honey Max (honeydew type).

Watermelon varieties are Crimson Sweet (OP- open pollinated), Jubilee II (OP), Fiesta, La Sweet (OP), Jamboree, Jubilation, Patriot, Regency, Royal Star, Royal Jubilee, Royal Sweet, Sangria, Stars 'n Stripes and Starbrite. Seedless varieties include Revolution, Summer Sweet 5244, TriX Carousel 212 or 313, Cooperstown and Millionaire. Ice box type: Sugar Baby. Yellow: Summer Gold and Tender Gold.



Crimson Sweet Watermelon

Viruses are a big problem in squash production. Try planting some of the new virus-resistant varieties: Prelude II and Destiny (yellow crookneck); Liberator and Conqueror (yellow straight neck); and Declaration, Payroll, Judgment III, Revenue and Independence (zucchini).

Pumpkins are much like winter squash, but the flesh often is coarser and stronger. Good varieties to try include Atlantic Giant, Prize Winner, Aladdin, Big Autumn, Merlin, Autumn Gold, Magic Lantern, Orange Smoothie, Sunlight, Early Abundance, Darling, Munchkin and Baby Boo. See the 2016 article on the LSU AgCenter's website: http://www.lsuagcenter.com/articles/page1478118930573 for more information from our 2016 pumpkin evaluations.

Sunlight Pumpkins

Cucurbit hints: Don't be concerned if the first several squash fruit fall off the plant before they reach an edible stage. The first flowers to form in early spring squash are the female flowers (with the miniature fruit). Male flowers do not form at that time, so no pollination takes place. In a few days, though, the male flowers appear and normal fruit set begins. In summer, the process reverses – with the male flowers usually developing first and the females later.

Cucumber yields may be doubled by growing plants on a trellis. To get cucumber vines to climb a trellis or fence, you may need to tie them to the trellis in the beginning. Once they catch hold, they will continue to climb.

Use pesticides on cucurbits late in the afternoon so as not to reduce the bee population. And be very careful to follow recommended rates and not sue pesticides that are particularly harmful to bees in your vegetable garden. Side-dress cucumbers, squash, watermelons and cantaloupes with 1½ pounds of calcium nitrate per 100-foot row as vines begin to run. Weekly applications of a general-purpose fungicide (Daconil or Maneb) starting at first bloom will

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protect the foliage and improve yield. Plastic mulch will reduce fruit rot and enhance the production of cantaloupes and the other cucurbits.

Lima beans (butter beans). Lima beans require warmer soil (70 degrees Fahrenheit, at least) than snap beans to germinate, so wait until soil warms (usually in early to mid-April) before planting. Bush varieties to plant are Henderson's Bush, Fordhook 242, Thorogreen, Bridgeton, Nemagreen, Dixie Butterpea or Baby Fordhook. Plant lima beans every two weeks through mid-May to extend the harvest. One-half pound of seeds will plant a 100-foot row when three or four seeds are planted every 12 inches within the row. Recommended pole lima beans are King of the Garden, Carolina Sieva, Willow Leaf, Christmas and Florida Speckled. Plant seeds 6-12 inches apart. One-quarter pound of seed will plant a 100-foot row.

Clemson Spineless Okra

Sweet potatoes. Plant seed potatoes (roots) during April and into May. Purchase weevil-free seed (root pieces). Transplants (the vines or slips) should be ready to cut in four to five weeks. Sweet potato slips (transplants) can be set out in late April if soil is warm enough (greater than 70 degrees Fahrenheit). Cut plants from plant bed about 1 inch above soil line and transplant.

Cutting rather than pulling helps reduce sweet potato weevils and many disease problems. Cuttings develop feeder roots within a day or two if the soil is warm and moist. Holding the cut slips in the shade for two to three days before transplanting will help increase survival. Use a low-nitrogen fertilizer such as 6-24-24 or 8-24-24 at 2-3 pounds per 100-foot row as a preplant fertilizer.

Okra. The soil needs to be warm (65-75°F) for okra seeds to germinate. Soak seeds overnight in tap water to soften seed coat before planting. Plant only 2-3 times as deep as the seed is wide. Keep soil moist until the seedling emerges.

Recommended varieties are Emerald, Annie Oakley (hybrid), Cowhorn, Cajun Delight-AAS, Red Burgundy and Clemson Spineless.

Peanuts. Shell peanuts, and plant about four seeds per foot of row. Plant peanuts in April and May. Spanish peanuts have the smallest seeds. Runner types have intermediate size seeds, and Virginia types have the largest. Fertilize lightly with 1-2 pounds of 8-24-24 or similar fertilizer per 100-foot row. Soil should be high in calcium. Try not to follow peanut crops with tomato crops. Rotate out of the nightshade family between seasons to reduce soil borne disease build up.

Onions, shallots and garlic. Harvest mature onion, garlic and shallot bulbs during the early summer. When mature, the tops begin to turn yellow or brown and fall over. Pull them, trim tops and roots and lay the plants on top of the row or place in burlap sacks for a couple of days to let them dry, if weather permits. Then store them in a cool, shaded and well-ventilated place. (Ideal storage for onions after drying is at temperatures of 45-50 F in a place with 65-70 percent relative humidity.)

Irish potatoes. Begin digging 90-110 days after planting. Plant tops start turning yellow as tubers reach maturity. Allowing the potatoes to remain in the ground a few days after tops die or after tops are cut will help set or toughen the skin and reduce skinning, bruising and storage rot.

To keep potatoes for several weeks, allow cuts and skinned places to heal over at high temperatures. Then store in a cool, dark place with high humidity. Do not store where they will receive light because they will turn green and develop an undesirable taste.

Southern Bacterial Wilt of Solanaceous Vegetables

By: Dr. Raj Singh, Director of LSU AgCenter Plant Diagnostic Center

Southern bacterial wilt is caused by the soil-borne bacterium called *Ralstonia solanacearum*. It is one of the most serious diseases of solanaceous crops including, tomatoes, eggplant and bell peppers. In addition to solanaceous vegetables, the bacterium can cause disease in a wide range of ornamentals. Hot, wet weather is highly conducive for disease development. The pathogen is spread within fields by the movement of infested soil, in irrigation water, and though the handling of infected plants.

Infected plants rapidly wilt due to loss of turgidity of

Wilted tomato pant (left) infected with southern bacterial wilt.

leaves and stems, giving the plants a limp appearance. Initially, these plants may recover overnight, but as the disease develops, rapid drying of the foliage occurs leading to permanent wilting and death of the plant. Brown, sunken cankers are often visible at the base of the plant near the soil line. Symptomatic plants exhibit discoloration of the vascular system and the pith.

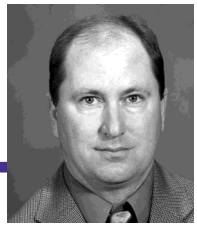
Managing southern bacterial wilt in soils previously infected with the bacterium presents a real challenge. There are no effective chemicals registered for commercial as well as home growers. Disease prevention is the key in reducing the spread to new un-infected sites. Soil fumigation may reduce the incidence of disease early in the season, but it has not provided long-term control. Soil solarization of contaminated fields during summer may also help in reducing the initial population of bacterium in the soil. Cultural management of southern bacterial wilt include avoid planting susceptible crops in infested fields, planting on raised beds, avoid late plantings of tomatoes in areas know to be infested and use of long-term rotations with non-host crops (such as corn, beans and cabbage). Vegetable growers must follow good sanitation practices to reduce the spread of the disease including avoiding movement of infested soils, avoiding movement of stakes from known infested sites to new sites and proper cleaning of tools. Disease resistant/tolerant varieties are not available to combat southern bacterial wilt.~

Eggplant infected with southern bacterial wilt.

Discoloration of lower stem of an eggplant (left) and internal vascular discoloration of a tomato stem (right).

Organic Weed Control Options

By: Dr. Ron Strahan LSU AgCenter Turf Weed Specialist



Many farmers prefer organic weed control in their operations. It is always a good idea to reduce the pesticide load on the environment. There's really no one strategy to rely on when it comes to managing weeds the organic way.

Almost immediately, people associate organic weed control with some type of organic herbicide. In reality, organic herbicides are one potential component. Organic weed control takes into account several non-chemical options that are often used in combination for managing weeds. Certainly, there are opportunities to use organic herbicides. But, temper your enthusiasm on their effectiveness. There are no organic herbicide magic bullets. Going organic for weed control will still be a combination of hand and mechanical removal, mulch and an occasional organic herbicide application. The following is a realistic view of weed management without synthetic herbicides.

Chamberbitter is easily recognizable by the seed pods attached to the bottom of the stem at each leaf node. Each pod contains 6 seeds. Photo by Ron Strahan

Understand weed biology

Weeds are the most common pest problem infesting growing beds and lawns. At the soil level, weeds are in direct competition with desirable plants for essential nutrients, water, and light. Some weeds can also increase other pest problems by serving as alternate hosts for insects, diseases, or nematodes. Every person that has a flower bed, lawn, or vegetable garden struggles with weeds.

South Louisiana has an especially long growing season for summer weeds. It's not unusual for summer weeds to linger deeply into December, allowing more time for seed production. Winter weeds germinate in the fall and start flowering and producing seeds by February. It's an ongoing cycle that continually adds weed seed to the soil seed bank.

When developing organic weed control strategies, it is very important to have a basic understanding of the biology of weed types that commonly infest our homesteads.

Types of Weeds - Weed species may be grouped into broadleaves, grasses, and sedges/rushes. Another basic division of weeds is by their life cycle into annuals and perennials.

Broadleaves - Broadleaves, or dicots have 2 seed leaves when emerging from the soil. Mature broadleaves have net-like veins on their leaves and showy flowers. Broadleaf weeds, as the name implies, have a relatively wide leaf compared with grasses. Some common troublesome broadleaf weeds are Virginia buttonweed (*Diodia virginiana*), spurge (*Euphorbia* spp.), and chamberbitter (*Phyllanthus urinaria*).

Grasses - Grasses are monocot plants with one seed leaf, parallel leaf veins, and lack showy flowers. Some common grassy weeds that infest landscapes are crabgrass (*Digitaria sp.*), goosegrass (*Eleuscine indica*), and torpedograss (*Panicum repens.*).

Sedges – Sedges are grass-like plants that are very

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common in landscapes. Sedge stems are usually triangular-shaped and solid. In wetter years or in landscapes that receive too much irrigation, yellow nutsedge (*Cyperus esculentus*) and kyllinga (*Kyllinga spp.*) are very common. However, the most common weed infesting flower beds is purple nutsedge (*Cyperus rotundus*). Believe it or not, purple nutsedge is ranked as the number one weed problem in the world. Yes, there is a ranking of weeds.

Purple Nutsedge Seed Head. Photo from the Louisiana Turfgrass Association.

Weed Life Cycles

Annual Weeds – Annuals are weeds that live for several months and die within a year. Annual weeds are prolific seed producers, and weed populations can increase exponentially from one growing season to the next. Spurge, chamberbitter, and crabgrass are common summer annuals. Annual bluegrass (*Poa annua*) and common chickweed (*Stellaria media*) are examples of winter annuals. Ultimately, the goal of annual weeds is to produce more seeds. Your job as a gardener is not allow seed production to occur.

Perennial Weeds – Perennials live longer than two years and may reproduce several times before dying. They generally have some underground storage organ such as a deep tap root, tuber, or rhizome that allows the plants to survive adverse conditions like frost and drought. Torpedograss is a perennial grassy weed that goes dormant during the winter and competes with landscapes during the spring, summer and deep into fall months. Purple nutsedge and yellow nutsedge are two common perennial sedges with underground tubers. Virginia buttonweed and dollarweed are common perennial broadleaf weeds. Perennial weeds are usually the most difficult weeds to control in landscapes.

Having knowledge about weed biology is important when it comes to success in controlling weeds. Since weeds are highly diverse, it will take multiple strategies to control weeds the organic way.

Hand removal

Hand weeding is a common practice for farmers and on a small scale, it's effective. If you are able to hand weed your beds a couple of times of week, several annual and some perennial weeds can be held in check. Chamberbitter, for example is a summer annual that is easily hand removed, but you better stay on top of it because it germinates throughout the summer growing season. Many of us don't have this much time to devote to such a laborious task.

For many weeds, hand weeding is only partially effective. Some weeds have defense mechanisms that can reduce the effectiveness of hand pulling. Spurge, an annual, often breaks at the stem when pulled, leaving

Common bermudagrass

the root or single stem available for potential reestablishment. Perennial weeds like purple nutsedge, torpedograss, and bermudagrass are ranked among the worst weeds in the world. Hand pulling only provides temporary satisfaction for severe perennial weeds such as these. Their underground structures remain in the soil after hand removal and these weeds are easily able to regenerate vegetatively and re-infest the landscape.

Mechanical weed pullers and tillage

Mechanical weed pullers can be successful on perennial weeds with long taproots such as dandelion, a common weed infesting lawns. But, weed pullers are ineffective against sprawling perennial grasses such as bermudagrass and torpedograss, or tuberous weeds like purple nutsedge. There are many benefits to tilling and other types of cultivation when used around vegetable crops with the ultimate goal of uprooting weeds and drying them out. Frequent cultivation works well in controlling annual weeds but home-

Torpedograss

owners have to be diligent because most germinate throughout the growing season. Tillage and hoeing often just redistribute the underground storage organs of perennial weeds.

Mulch

Mulch is an extremely important tool for weed management in landscape beds. Materials used as mulch act as a physical barrier to the emerging seedling, and prevent sunlight from reaching the soil surface.

Spurge

Blocking sunlight is important because some weed seeds, such as crabgrass and goosegrass, will not germinate without stimulation from light. Also, light is critical for the new weed seedling to begin photosynthesis for growth and development.
Several materials that are suitable for mulch include compost, leaf litter, pine bark, pine mulch, and pine straw. Even newspapers can be used as a barrier to weed emergence. Mulches must be thick enough to block light to be effective. As a rule, mulch trees to a depth of 3-4 inches and shrubs to a depth of 2-3 inches. Mulch makes a huge difference and can really cut down on some of the hand weeding. Though mulch is beneficial, it will not completely hold back weed infestations. Perennial weeds such as torpedograss, nutsedge, and bermudagrass eventually break through mulches.

Weed fabric materials and plastic mulch have a fit for certain situations such as in vegetable gardens. However, weed fabrics in a woody landscape bed are not without issues. They tend to hold too much moisture in the root zones of shrubs, potentially leading to root rot issues. Weed fabrics are also messy to remove when it is time to renovate landscape beds.

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Organic Herbicides

Most organic herbicides are sprayed on the leaves of actively growing weeds. They work on contact and burn back leaf tissue. Organic herbicides can work well on newly-emerged annual broadleaves and grasses. However, as annual plants mature and harden off, organic herbicides become less effective, and repeated applications will be necessary. Organic herbicides are least effective on perennial plants because perennial plants have tremendous recuperative potential due to their underground storage organs. Organic products may burn back the leaves of a perennial weed like torpedograss, but these herbicides do not move downward to plant rhizomes. Torpedograss easily recovers, similar to the way the weed recovers from a frost. That is the organic herbicide's greatest flaw. There's a reason why synthetic/non-organic herbicides like glyphosate are popular. Glyphosate translocates to roots, tubers, and rhizomes, and completely kills many troublesome perennial weeds.

Hand weeding is 100% organic.

I've had the opportunity to evaluate several ready to use organic herbicides over the past few years with varying degrees of success. Some of the products that I have evaluated includes a vinegar-clove oil mixture, soybean oil, citrus oil, iron based products, cinnamon based products, and mix-your-own pelargonic acid (fatty acid) herbicides. Single applications were effective on tender, young weeds but at least two applications were necessary on annuals that were greater than 5 inches tall. Most products that I looked at provided a good top kill. Spray coverage is essential since these herbicides work on contact. One of the better organic herbicides evaluated was pelargonic acid (trade name Scythe). In my opinion, most of these ready to use organic products are potential alternatives to synthetic herbicides on actively growing annual weeds when timed appropriately. Early application before annuals become mature is the key to their success.

Corn gluten meal, a byproduct of the corn wet-milling process is natural patented preemergence herbicide. The herbicide works by inhibiting the root formation of germinating plants. Tests conducted by the LSU AgCenter a few years ago showed that corn gluten could be an effective weed preventer. I was very impressed with this herbicide initially on preventing the emergence of winter annuals such as common chickweed and annual bluegrass. However, weed control started breaking down about 2 to 3 weeks after the corn gluten was applied. Periodic reapplication will be necessary but results indicated that there is potential for corn gluten to be part of an overall organic weed control program. Unfortunately, it won't help you on perennial weeds.

As for homemade organic herbicides, there are organic weed control recipes all over the internet. Use caution! Several have table salt/sodium as one of their active ingredients. Applying table salt around desirable plants is not a good idea because excessive sodium will kill or injure most landscape plants. Unfortunately, torpedograss is extremely tolerant of sodium. Salt applications will create an environment that torpedograss will thrive in. Also, salt can be very difficult on soil by raising pH levels and cause excessive compaction problems.

Summary

I feel your pain! Weeds can be overwhelming, especially perennial weeds. There is no single action that will eliminate unsightly weed problems on your property. It will take a combination of several strategies to provide some degree of success. I wish that I had a better answer for you when it comes to controlling perennial weeds organically. That's where synthetic herbicides like glyphosate have really helped.~

Mushroom Cultivation

By: Will Afton, LSU AgCenter ANR Extension Agent

Over the last several years the availability and variety of mushrooms has exploded within the food industry. Hundreds of species of fungi have a made a significant contribution to not only the food industry but also the pharmaceutical industry as well. It is estimated that there are over 2,300 species of fungi that have an edible or medicinal value. Many of these species were found through the collection and harvesting of wild fungi. However, there is a growing popularity in commercial cultivation to supplement wild harvests. Furthermore, with fear of ingesting a toxic species, many people feel safer when cultivating known varieties of fungi.

Oyster Mushrooms from Pontchartrain Mushrooms in Slidell, LA.

Biology

Mushrooms belong to the kingdom Fungi and are distinct from other organisms like plants, animals, and bacteria. Unlike plants that use chlorophyll to absorb light energy for photosynthesis (the process used by plants to convert carbon dioxide into organic compounds), fungi rely on other organisms (substrates) as food sources. Fungi are classified on how they obtain nutrients. Parasitic types attack and feed on living organisms. Symbiotic fungi live in close relation to another organism and share a beneficial relationship. Saprophytic fungi obtain nutrients from dead organic material. Most of the fungi species cultivated for food are saprophytic types, while some like chanterelles are classified as symbiotic.

The basic life cycle of a fungus involves three stages. The first stage is referred to as the vegetative stage. This is where a fungal spore lands on a suitable substrate and germinates to produce hyphae which are filamentous structures that serve as the main mode of vegetative growth. The hyphae complex is called mycelium. The second phase is known as the reproductive phase. It is this phase where we start to see the fruiting bodies of the fungus (stem and cap) start to form. The third phase is the spore production phase and is when the spores are created and dispersed. Understanding the various stages of fungal development makes cultivation a little easier to tackle.

Cultivation

Mushrooms can be cultivated both indoors and outdoors. The basic process starts with inoculation (addition of fungal spores) of the substrate followed by a period of vegetative growth. The substrate is inoculated with spawn. Fungal spawn is produced in a controlled environment where a carrier product like sawdust or grain is inoculated with spores from a specific mushrooms species. The process of using pre-inoculated spawn increases the success rate of transferring the desired fungi to the substrate. Once transferred, the fungi grow and develop on the substrate. Sunlight, humidity and temperature are monitored until conditions are favorable for fruiting where the mushrooms are then harvested and packaged for sale.

Substrates

Natural Logs

Log cultivation imitates the natural nutrient recycling

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process that occurs throughout the environment. Hardwood logs between 3-8 inches in diameter are cut in 36-42 inch pieces. Keep an eye out for anyone cutting or removing hardwood trees species such as black cherry, hickory, magnolia, maple, and oak because these leftover products can be worked into a sustainable mushroom production program. Let the fresh cut logs age for several weeks before use. Once aged the logs are drilled with ½ inch holes 6 inches apart, inserted with spawn, and allowed to set in a shaded area for 6-18 months. The inoculated logs will naturally fruit in spring and fall once the fungus enters the reproductive phase. They can also be forced into fruiting by submerging in cold water for 12-24 hours. Forced fruiting allows growers to spread out the harvesting period and provides for a consistent inventory.

Alternate substrates

Because fungi decompose organic materials, alternative substrates can be used to produce a crop. Wheat straw, sawdust, and woodchips are popular choices but other products can be used and will have a quicker harvest turnaround. The substrate material should be pasteurized before inoculating with spawn. To pasteurize, rinse the substrate with hot water. A five-gallon bucket works well for this step. Make a solution using 1-liter hydrogen peroxide and 1-gallon water and pour onto the rinsed substrate. Use a weight (dinner plate works well) to keep substrate submerged in solution for 6 hours. Allow excess liquid to drain and material is ready for spawn. Disinfect a plastic bag (recycled grocery sacks work well) using alcohol wipes, fill with pasteurized substrate, add spawn, and tie off the end. Bag will simulate a humidity chamber allowing mycelium to develop at a fast rate. In 2-4 weeks cut holes into the side of the bag to allow room for fruiting.

Species for Beginners

Oyster mushrooms are some of the easiest to grow mushrooms and work well as first time crop for a beginning mushroom cultivator. The prefered substrate of choice for these mushrooms are alternative substrates like wheat straw, sawdust, or wood chips. However, they can also be grown on natural logs. Due to their ease of production, you will see many different varieties of oyster mushroom in the trade.

Shiitakes are probably the most popular mushroom used by small-scale cultivators. They are easily grown on natural logs, but like oysters, can also be used with alternative substrates like woodchips, sawdust, or straw. Within the shiitake group, you will see both warm and cool weather varieties. Warm weather varieties will fruit throughout the summer months where as cool weather varieties will fruit throughout the winter months.

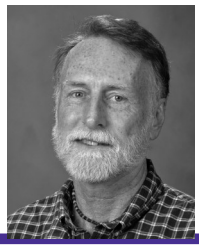
A wide selection of mushrooms on display at a local farmer's market from Mushroom Maggie's Farm in St. Francisville, LA.

In conclusion

Mushroom cultivation is not for everyone. It takes knowledge of fungi lifecycles, some financial investment, and time to produce a crop. When included with other farming activities, mushroom cultivation can be used to augment sales while adding interest to the farm inventory. The use of alternative substrates is also a great way to recycle products on the farm, making it a sustainable practice. ~

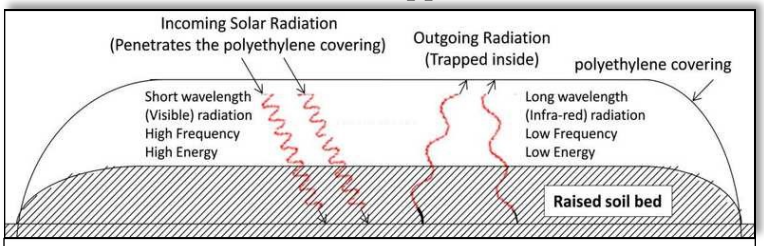
Use the Sun for Weed, Nematode, Insect and Disease Control

By: Dr. Joe Willis, LSU AgCenter ANR Agent



Soil solarization is a simple, safe and environmentally friendly way to control plant parasitic nematodes, soil-borne plant pathogens and many weed pests. While simple, the effectiveness of soil solarization is highly dependent on good technique. Just throwing a sheet of plastic on the ground and waiting a few weeks will get you nothing. Let's take a look at a few what's, why's and how's about soil solarization.

Soil solarization uses the radiant energy of the sun to increase the underlying soil temperature to levels that are lethal to most soil inhabiting organisms including many weeds. Under proper conditions, soil temperatures reach up to 180°F at a 2" depth and up to 100°F at an 18" depth. Control of soil pests is usually achieved in the upper 4-12" of soil but good control is most often achieved in the upper 8" of soil.



Clear plastic sheets allow Radiant energy to heat the soil directly while retaining the heat and water vapor. *Source: Deepa Khulbe*

Solarization is most effective when the plastic sheeting is laid as close as possible to a smooth soil surface. Tilling or hand turning should be the first step in solarization. Break up any clods that are present and remove any rocks or debris that can puncture or damage the plastic sheeting. Smooth the surface with a rake.

Moist soil is a better heat conductor than dry soil and many organisms are more vulnerable to heat in highly moist conditions. The soil must be at 70% field capacity moisture to achieve optimal results. Wet the soil deeply prior to covering with the plastic. You also want to apply the plastic sheeting as soon after wetting as possible. Alternatively, you can lay down a soaker hose or a similar irrigating setup prior to covering with plastic and then wet after the area is covered. If the plastic is properly installed and sealed around the edges, there is no need for additional watering during the solarization process.

Clear polyethylene plastic sheeting 0.5 to 4 mils thick is best. The plastic should be thick enough so that it is not easily punctured but thin and flexible enough for easy installation. Do not use white, black or any dark plastic. These materials do not allow enough solar radiation to properly raise the underlying soil temperature. Repair any punctures or tears in the plastic immediately with greenhouse tape (duct tape works in a pinch). A double layer of poly with a thin insulating air layer between has been shown to increase the underlying soil temperature by as much as 10° over the single layer. Just something to consider.

Dig a 5"-6" deep narrow trench around the area to be covered

Lay plastic placing the edges in the trench. Refill trench to seal the covering.

Dig a 5"-6" deep narrow trench around the area to be covered prior to laying the plastic and place the removed soil to the outside of the area. Lay the clear plastic and lay the edges in the bottom of the trench and then backfill. It is essential that the edges be sealed to hold in the heat and moisture. A depth of at least 5" is recommended to prevent wind from loosening the sealed edge.

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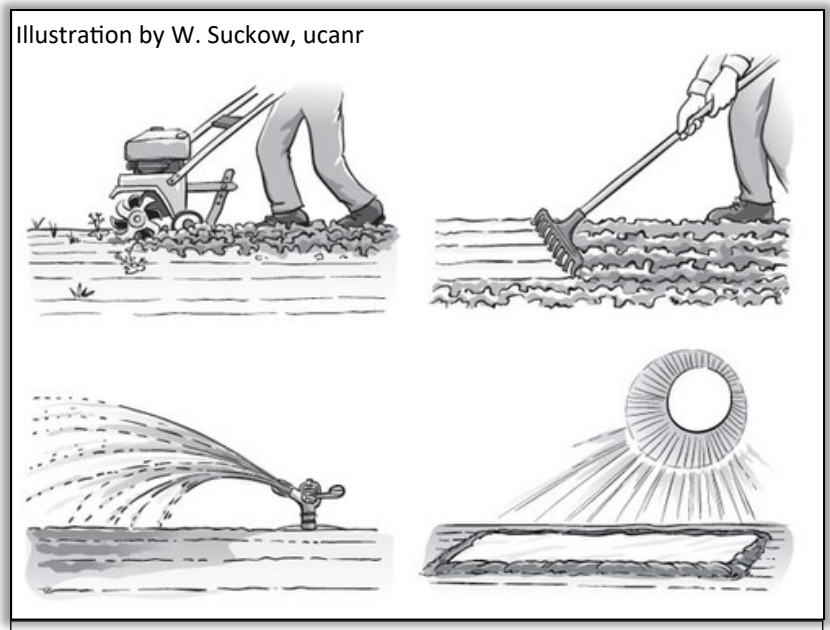
Areas to be solarized should be at least 30" wide based on studies performed at the University of California. If the strips are narrower, you really won't be solarizing the entire root zone for what you plan to grow. If you are solarizing a large area, you may want to break it up into sections for ease of laying the plastic and plastic stability. Use your best judgement here.

Studies at College Station, TX using 10'x10' plots were performed in 2011 and 2012. During a 31 day period from May 12 to June 11, air temperatures reached about 90° F, soil temperature reached about 110°F, and solarizing soil reached about 155°F. During a 29 day period from June 24 to July 22, air temperatures reached about 98°F, soil temperature reached about 120°F, and solarized soil reached about 180°F. During a 63 day study from August 14 to October 16, air temperatures reached about 100°F, soil temperatures reached about 120°F, and solarized soil reached about 180° F. From this study we can see how the process of solarization greatly raises the underlying soil temperature to levels lethal to many weed seed, nematodes, bacteria and fungi. We can also see how the timing of the treatment effects solarized soil temperatures. Maximum temperatures were reached when the sunlight angle was closest to 90° (when the path of the sun was directly overhead) and the days were longest (allowing for more time during the day to heat the soil).



1: Cultivate the soil.
2: Rake and level the soil.
3: Irrigate the soil.
4: Cover the soil with clear plastic
5: Secure the edges of the plastic
6: Wait patiently

In most locations, the plastic should remain in place for 4 to 6 weeks in order to reach maximum soil depth temperatures. Some very heat-sensitive organisms are killed within 14 days and relatively resistant organisms may require closer to 6 to 8 weeks. Knowing what problems in the soil you are trying to control will help you decide how long to leave the solarization in place. However, leaving the solarization for longer than 8 weeks has shown indications of being deleterious to the soil.

After the solarization process is complete, you can remove the plastic and plant the area. There are two important considerations at this point. First, do not till or disturb the soil any deeper than 8 inches. Doing so will bring organisms and seeds to the surface that have not been effected by the solarization process. Second, soil solarization is non-specific, so beneficial organisms are also killed. Adding a layer of high quality compost before planting will repopulate the soil with beneficial microorganisms. This will also allow the beneficials to establish quickly and outcompete any pathogenic microorganisms that may still be there or are introduced later. But remember, do not till or mix deeper than 8 inches.

An alternative planting method after solarization is to simply cut holes in the plastic and plant through into the soil. Leaving the plastic in place will act as a barrier and plastic mulch. Important note: if you do leave the plastic, it needs to be covered with a layer of dark mulch to keep the underlying soil from continuing to reach extreme temperatures under the sunlight.

There are some disadvantages to soil solarization. The main one is that the land is taken out of use for the solarization time period. With high-intensity farms, this may be a severe disadvantage. Solarization may not control all pests. Some are difficult to control without more drastic approaches such as chemicals. If strip solarization is performed, the furrows between the strips don't get solarized and can serve as sources of reinfection.

But overall, soil solarization is and easy, inexpensive, nonpesticidal and effective way to control many soilborn pests, improve soil tilth, increase beneficial microorganism populations and fits in to an organic production model.~

New Resources for Cover Cropping in the South

By: Anna Timmerman, LSU AgCenter ANR Agent

The benefits of cover cropping are many. Cover crops build soil organic matter, sequester nitrogen (legumes), prevent erosion, improve soil moisture holding capacity, suppress weeds, and protect bare soil. Cover crops can fit into just about any growing rotation, whether that be an in-ground system or raised beds. Timing, selection, and proper management of cover crops is key to getting the most out of them.

Many of the studies and written resources surrounding cover cropping had previously come from more northern land grant universities, but that has recently changed with the formation of the Southern Cover Crops Council or SCCC (www.southerncovercrops.org). The council is made up of southern USDA and land grant researchers, farmers, extension specialists, natural resource conservation (NRC) personnel, industry reps, and non-governmental organizations. Together, these stakeholders are invested in the sharing of knowledge and research surrounding cover crops and their integration into all southern farming systems.

While still a new collaborative council, the SCCC has recently released some amazing resources for southern farmers to aid them in making the right selections when it comes to cover crops in their growing systems. A set of three resource guides are either completed or in the works, with the row crop guide currently posted and the vegetable guide planned for release in July 2019. Grazing cover crops will be the final resource guide added to the set later in 2019. The resource guide utilizes small geographic-specific groupings of parishes or counties to make the information presented more appropriate for each region. A link to the Cover Crop Selection Tool for the Southeast (Excel spreadsheet) is also available through the resource guide.

Farmers and growers in all types of farming sectors would benefit from checking out the many cover crop information sheets available in the resource guide currently available on the website. Crops are broken down by season and type (brassicas, legumes, small grains, broadleaf). A "functions and rankings" page is especially helpful for choosing the correct crop for any growing system. Resource guide factsheets include specific varieties of each crop type that perform well in our southern climates. They also tell where to source seed for each crop. A planting information section details ideal seeding rate, depth, and planning method.

Termination at the proper growth stage is a key part of cover cropping. Each factsheet tells growers how to effectively terminate the crop and how to identify when it is at its most useful growing point. This helps to prevent a cover crop from becoming too large to manage and mow/till under or become a weed pest inadvertently. Each factsheet also includes a cultural traits section that details the typical nitrogen range that each crop will contribute to the soil as well as any words of caution regarding that specific cover crop. Eventually, the website will include an interactive cover crop selection tool available free to growers.

Additional information available on the website includes many links to financial assistance programs for cover cropping expenses, information on affordable equipment rental, a directory of local experts broken down by state, and additional

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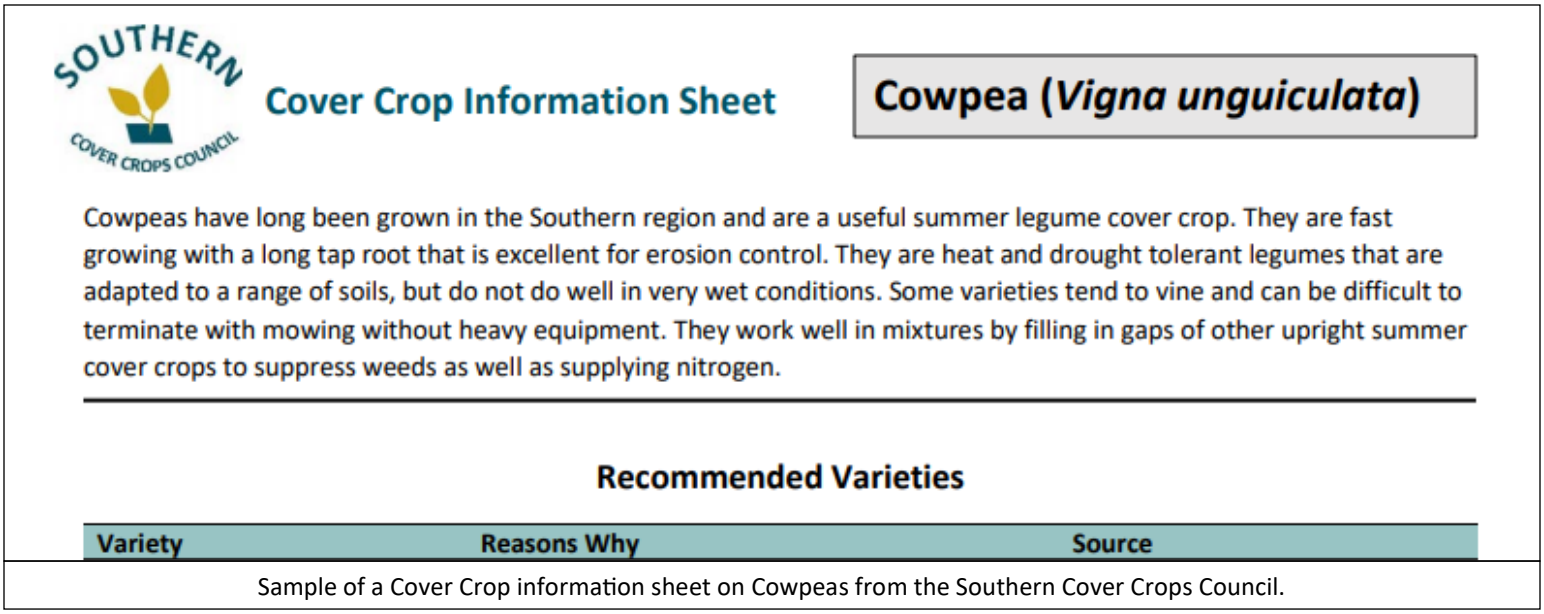

Cover Crop Information Sheet

Cowpea (*Vigna unguiculata*)

Cowpeas have long been grown in the Southern region and are a useful summer legume cover crop. They are fast growing with a long tap root that is excellent for erosion control. They are heat and drought tolerant legumes that are adapted to a range of soils, but do not do well in very wet conditions. Some varieties tend to vine and can be difficult to terminate with mowing without heavy equipment. They work well in mixtures by filling in gaps of other upright summer cover crops to suppress weeds as well as supplying nitrogen.

Recommended Varieties

Variety	Reasons Why	Source

Sample of a Cover Crop information sheet on Cowpeas from the Southern Cover Crops Council.

resources such as extension publications and journal articles.

The SCCC has a conference in the works for July 16-17 in Auburn, Alabama. Current resources as well as forthcoming research will be presented. The vegetable cover cropping guide will be released at this event as well. Joining the council is pretty affordable ($10 students, $20 growers, $40 industry professionals) and offers members a 10% discount on events and the conference. Members are also first to gain access to new resources as well as receive advance registration information for conferences, field days, and classes. Members can volunteer to give feedback on existing programs and weigh in on what resources need to be developed in the future.

SAVE THE DATE → JUNE 27, 2019

FIELD CROPS • BEEF CATTLE & FORAGES • HORTICULTURE

Field EXPO Day

LSU AGCENTER DEAN LEE RESEARCH & EXTENSION CENTER ALEXANDRIA, LA

EXPO Highlights:

- Industry EXPO-Equipment, Technology, Production & Pest Management Products.
- Field Crops Research-Cotton, Corn and Soybeans.
- Beef Cattle & Forage Research.
- Horticultural Demonstrations w/ LSU AgCenter Super Plants
- Youth Activities & 4-H Mini Farm
- Food Preservation Workshop (Registration required)

Opens at 2:30 PM

Sponsored meal at 6 PM

An interagency training will be held in the morning from 10 AM until NOON.

For details contact or assistance with special needs: Tara Smith at 318/473-6520 or tsmith@agcenter.lsu.edu.

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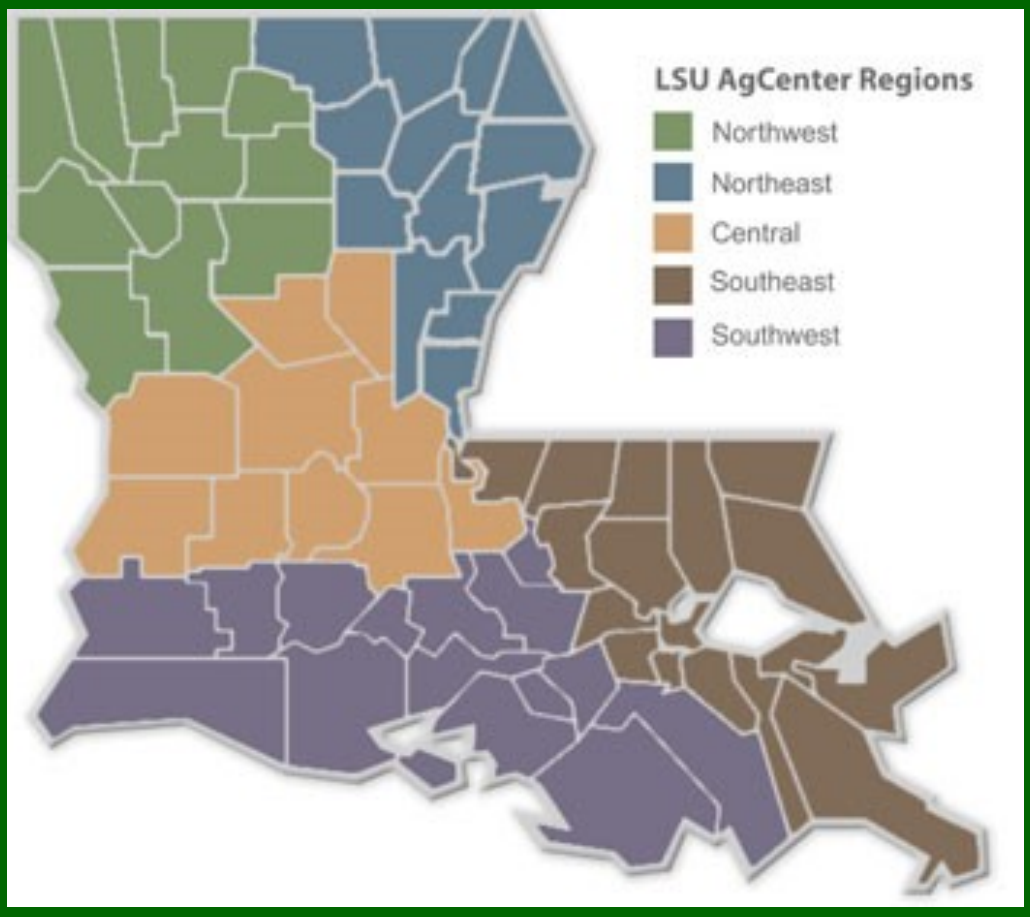

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