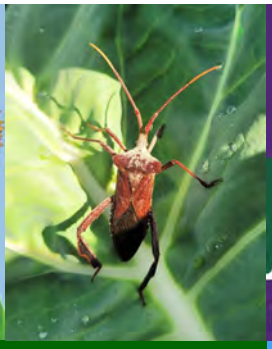
# GNO Gardening



LSU AgCenter
Research · Extension · Teaching

GNO Gardening Magazine

December 2021

## In This Issue:



Cover photo:
An arrangement of cut Intenz Classic Celosia flowers. Photo by Chris Dunaway

# Super Plant Spotlight
# Intenz Classic Celosia
# (*Celosia argentea var. spicata Intenz Classic*)

Celosia plants come in three distinct forms: crested, plumed and wheat.

Plumed celosias, commonly called celosia or prince's feather, produce fluffy plumes that are broad at the base and taper to points. They come in a variety of colors, including burgundy, red, magenta, orange, pink, gold and yellow.

Crested celosias are commonly called cockscombs because the flower heads resemble the combs of roosters. The colors are similar to the plumed types and are bright and vibrant. The plants range in size from 18 inches to 3 feet or more.

Wheat celosias look distinctively different from the other two types. For one thing, the plants are very large, growing from 3 feet to over 6 feet tall. This has tended to limit their use in gardens, and most gardeners are not as familiar with them as they are the plumed and crested types. They are also more upright growing and not as shrubby as the other types. Finally, the flower head is narrow and long and shaped like a spike. The color range is more limited, tending toward white, pink and magenta. The leaves are generally green with purple areas and are attractive.

Photo by Chris Dunaway

Intenz Clasic Celosia growing in a garden. Note the compact size.

The wheat celosias also tend to be more vigorous and resilient. They have no problem blooming continuously from late spring until late summer and have few pest problems. Indeed, they are among the most care free of garden flowers. They do not need a lot of fertilizer to perform well. Once established, they will rarely need watering. Celosias in generally tend to be drought tolerant, but the wheat types are especially tough.

The large size of these plants is one of the main reasons that this plant is less well know. Many gardeners do not think they have room for a 6' tall plant plus the size make it difficult to work with in the nursery. The good news is that wheat celosia can easily be grown from seed and, in fact will re-seed itself for the following season.

**Intenz Classic celosia**

That brings me to the new Louisiana Super Plant selection: Intenz Classic celosia (Celosia argentea var. spicata Intenz Classic). This compact version of

# Super Plant Spotlight
# Intenz Classic Celosia
# (*Celosia argentea var. spicata Intenz Classic*)

wheat celosia only grows about 18 inches tall and 12 inches wide. The spiky flower heads are generally rich purple. Although the color may fade some in the heat of summer, the lighter color is also beautiful. Each flower spike blooms for a long time, and the plants produce lots and lots of them. The foliage is green with some purple tints.

Performance of this celosia in Louisiana has been outstanding. Heat and humidity have no effect on the vigor. Pest problems are few, and the plants do not have to be pampered. They do fine with only occasional irrigation during pronounced dry periods. Old flower spikes can be removed as needed to keep the plants looking neat.


This standard wheat celosia has grown to nearly 5' tall.


Cut flowers last a long time plus the flowers may be dried and they will maintain their vivid colors.

If you plant butterfly, bee or pollinator gardens, you definitely want to include Intenz Classic celosia in your plantings. While the flowers are small, they are rich in nectar and attract butterflies, bees and hummingbirds.

Plant Intenz Classic celosia transplants into sunny (eight hours or more of direct sun), well-prepared beds with good drainage. They also look great planted into containers alone or combined with other summer bedding plants. Be sure to bring in some cut flowers to beautify your home.

~Chris Dunaway

# December Vegetable Planting Guide

| Crop | Recommended Variety |
|---|---|
| Beets | Detroit Dark Red, Kestrel, Red Ace F1, Ruby Queen |
| Brussels Sprouts | Jade Cross E, Long Island Improved |
| Cabbage | Blue Vantage, Platinum Dynasty, Stonehead, Cheers, Blue Dynasty, Emblem, Rio Verde |
| Carrots | Danvers 128, Purple Haze, Thumbelina, Apache, Enterprise, Maverick, Sugar Snax 54 |
| Celery | None Given |
| Chinese Cabbage | None Given |
| Collards | Champions, Flash, Georgia Southern, Top Bunch, Vates |
| Garlic | **Creole:** Early, Louisiana, White Mexican; **Italian:** Early Red, Lorz; **Large:** Elephant (Tahitian) |
| Kale | None Given |
| Kohlrabi | Early Purple Vienna, Early White, Vienna, Winner |
| Leeks | Alora |
| Lettuce | Esmeralda, New Red Fire F1, Nevada, Tall Guzmaine Elite |
| Mustard Greens | Florida Broadleaf, Greenwave, Red Giant, Southern Giant Curled, Savannah, Tendergreen |
| Onions | **Red:** Red Creole, Southern Belle; **White:** Candy, Savannah Sweet; **Vidalia:** Candy Ann, Caramelo, Century, Georgia Boy, Mata Hari |
| Radishes | Cherriette, Champion, White Icicle, April Cross |
| Shallots | Matador, Prism |
| Spinach | Bloomsdale Long Standing, Melody, Tyee, Unipak 151 |
| Swiss Chard | None Given |
| Turnips | Alamo, All Top, Purple, Top White Globe, Seven Top, Southern Green, Top Star, Tokyo Cross |

# Holiday Cacti and Their Care

Some of the most plants given as gifts this time of year are holiday cacti. Even if the name is not familiar, most people recognize the characteristic look of holiday cacti. They are seen all throughout the houseplant sections of garden centers and home improvement stores during the holiday season. Perhaps you have been given one as a gift or given one to someone else. Keep reading to learn more about how to care for these easy to grow plants.


*Schlumbergera truncata* exotic dancer. " 'Exotic Dancer' is popular cultivar of Thanksgiving cactus grown worldwide. Here it is fresh out of a production greenhouse and available for sale at a retail garden center in Covington, LA."

All cacti are members of the family Cactaceae, which contain about 127 different genera and over 1,750 different species. The vast group can be broken down into two different types. When most people think of cacti, they think of the desert dwelling plants loaded with spines. These cacti are correctly termed "desert cacti". However, there is a second group of cacti that grow on trees in tropical and sub-tropical forests. "Forest cacti" are known as epiphytes, which are plants that grow on other plants for support but are not parasitic. Because of this nature, forest cacti prefer partial shade locations. Holiday cacti are members of the forest cacti group. Both groups are native to the Americas.

Holiday cacti include the Thanksgiving cactus (*Schlumbergera truncata*), the Christmas cactus (*S. x buckleyi*), and the Easter cactus (*S. gaertnerii*). The orchid cactus (*Epiphyllum ackermanii*) is also grouped together with the holiday cacti. To distinguish Christmas and Thanksgiving cacti from Easter cacti, look at the flat stems that make up the shoots. Most of us may call these flattened stem segments leaves, but botanically speaking, cacti do not have leaves. The modified stems of these cacti are called phylloclades, are filled with chlorophyll, hence the green color. They act just like the leaves in other plants. The flattened stem segments of Christmas and Thanksgiving cacti have a distinctive toothed edge (Thanksgiving cacti have sharper points) whereas Easter cacti exhibit a scalloped edge. They virtually look the same except for time of year when they flower.

To properly care for any of these holiday cacti it is important to understand their native environment. These plants originated from the jungle region of the western hemisphere. Like previously stated they grew within the canopy of large trees. Do not place your cacti in an area that receives a lot of direct sunlight.

# Holiday Cacti and Their Care

Choose a location that receives bright but filtered light. An area with an eastern or southern facing window should work well. Watering these cacti will be a little different than watering a desert type cactus. Holiday cacti will need more water but be careful not to keep the soil wet. Wet soils will contribute to root rot and poor plant health. Instead, add water to the soil until it drains out the bottom of the pot. Check the soil from time to time until you feel it completely dry from the tip of your finger to the first knuckle. This will indicate when to water the plant again. Use a water-soluble fertilizer in the spring and summer to provide essential plant nutrients. A few insect problems may arise during the growing season. Applications of horticultural oil will provide adequate control.

Pointed teeth of thanksgiving cactus.jpg, "Here's a close up view of phylloclades, which are flat stem segments that function like leaves in forest cacti. These sharp pointed teeth are characteristic of *S. truncata*, the Thanksgiving cactus. Flower bud formation has begun!"

One of the biggest issues facing Christmas cacti is second and subsequent year blooming. The plants available for sale at plant nurseries come out of commercial greenhouses and are forced to bloom heavy at the holiday season. The new owner of a holiday cactus will need to do a few things to ensure blooms in the following season. The typical flowering season for holiday cacti is from November to January. Once flowering has finished let the plant rest. Keep it cool and back off on watering. After about 8 weeks you can start treating it like normal, providing water when the soil becomes dry. During the summer months you can move the plant outside to a filtered light location. Early fall is a crucial time for flower bud production because these plants are influenced by photoperiod. The shortening of days after the fall equinox signals to the plant that its time to produce flower buds. Back off on watering and keep it cool. You might even want to move the plant to a cooler location. When flower buds form you can return to regular watering practices. Be careful not to overwater during this time. Stress conditions may result in aborted flowers. The plant should start blooming again late fall through the first of the year. Enjoy and show it off for all to see. Then start the process over again.

~Will Afton

# Weed of the Month
# Common Goldenrod (*Solidago canadensis*)

Once the hated enemy of all allergy sufferers, its reputation has been redeemed by closer investigation. As Dr. Heather Kirk-Ballard says, "Don't blame the goldenrod – it's the ragweed. Both plants bloom at roughly the same time each fall, but goldenrod often gets the blame for the problems caused to allergy sufferers. While it is possible, although rare, to be allergic to goldenrod, your seasonal sniffles are most likely caused by ragweed." (Figure 1)

Ragweed (*Ambrosia* spp.) could have been our weed of the month since it is blooming and common this time of the year. But goldenrod is so much more noticeable and much prettier too. There are at least 13 species of *Solidago* that have been reported in Louisiana, but only 4 have been reported in the Greater New Orleans area – *Solidago altissima* (tall goldenrod), *Solidago canadensis* (common goldenrod), *Solidago rugosa* (wrinkle-leaf goldenrod), and *Solidago sempervirens* (seaside goldenrod). Additionally, according to the Plants of Louisiana website, *Solidago gigantea* (giant goldenrod), *Solidago odora* (fragrant goldenrod) and *Solidago nitida* (shiny goldenrod) have been reported in St. Tammany parish. Common goldenrod *Solidago canadensis*he is the most commonly encountered species in our area. As a member of the Asteraceae family, goldenrod has composite flowers. Each "flower" along the goldenrod


Figure 1. Goldenrod in bloom at left. Ragweed on the right.

# Weed of the Month
# Common Goldenrod (*Solidago canadensis*)

flower branch is actually a composite of ray flowers and disc flowers (Figure 2). Disc flowers are perfect (having both male and female parts) and ray flowers are imperfect being either male or female.

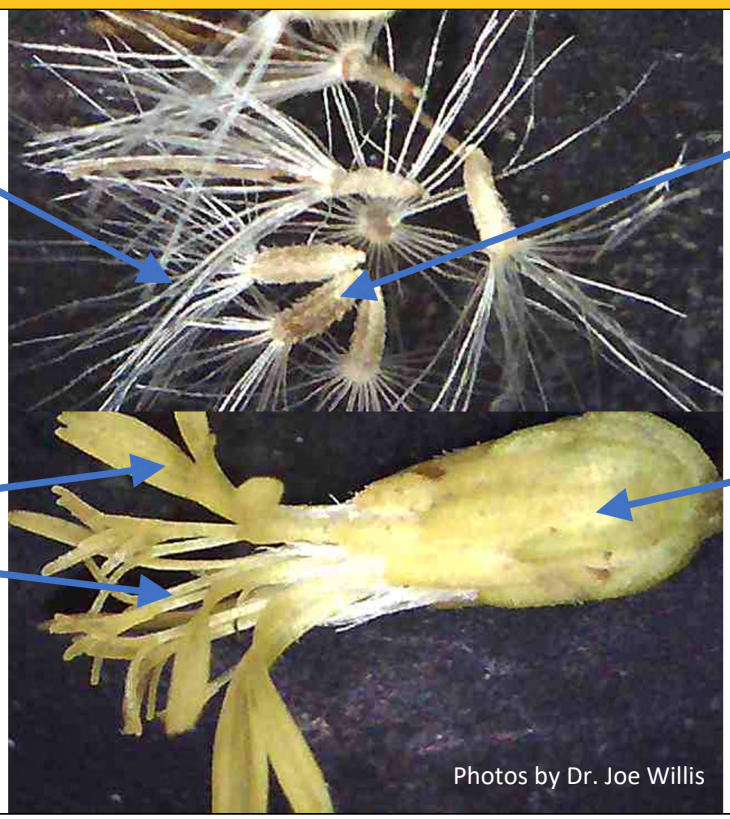



Figure 2: Diagram of flower head (ray flowers and disc flowers) and seed (achene) with attached pappus of *Solidago canadensis*.

*Solidago canadensis* is a perennial and spreads by seeds and rhizomes. It has simple, alternate, sessile (no petiole) leaves. Each leaf is lanceolate with moderate dentation on the edges, varying in length from 1 to 7 inches. Plants produce a tall (1.5 to 6.5 feet), leafed stem terminating in a pendulous branching flower spike. Flowers are an attractive bright yellow about 1/8“ long and appear in August through November, followed soon by white fluffy panicles of seed (fruits).

The fruit/seed of common goldenrod is a brown, oblong seed (achene) 1/16” long, with a tuft of whitish hairs (pappus), slightly longer than the seed, attached at the tip to aid in wind dispersal.

Common goldenrod is found growing in fields, meadows and disturbed areas. It is also found growing in a lot of home landscapes, especially those of native plant enthusiasts. Butterflies, bees and other pollinators love it. A word of caution, common goldenrod is an aggressive spreader by both rhizomes and seeds. If you add this plant to your landscape, be prepared for what might follow.

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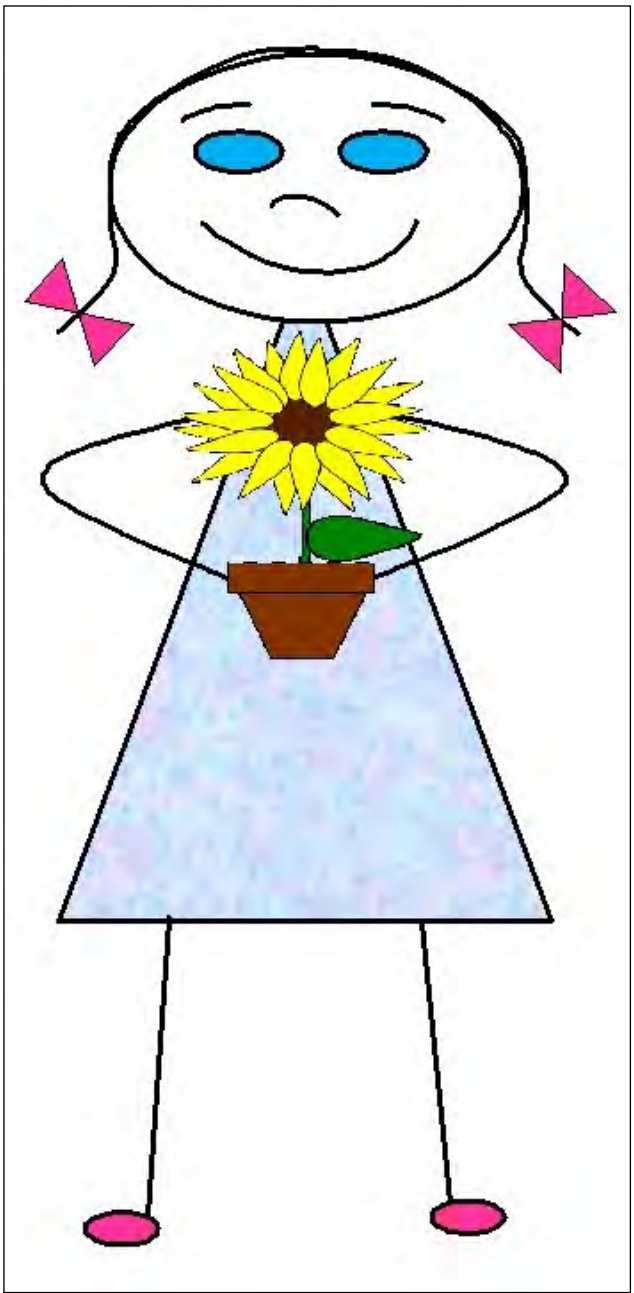
~Dr. Joe Willis

# What's Bugging You?
# Two-Legged Pests-Humans (*Homo sapiens*)

This article is probably not going to be about what you'd expect! Usually this is a space to discuss insect pests, mites, mollusks, fungus, and other pathogens that impact our gardens. Recently, I was reminded of another pest in the garden when a straight-species Stokes Aster (*Stokesia laevis*) planted in front of my home mysteriously disappeared between the hours of 8:00 AM and 4:30 PM. When I noticed it missing, I checked for signs and clues to help me narrow down what happened to it. Leaves chewed down? No, the plant was gone. Vanished. No sign of insects, no brown leaves laying on the soil surface like it wilted back in the dry weather. The plant was gone with nothing left behind but a hole in the ground.



Stick figure Anna

I'd had similar things happen when I was working as a commercial landscape contractor  but it had been so long since I'd had plants "walk away" that I'd forgotten about a rare and unusual pest that sometimes impacts our gardens - humans!

Over the years, I've had plants taken overnight from municipal planters, hundreds of flowering annuals dug up without a trace. Whole pots taken from client's porches, watermelons, tomatoes, and green peppers ready to pick, gone without a trace the next morning from gardens. Urban, suburban, rural, all areas are not immune to the elusive human. Here are some ways to manage for this particular plant pest:

1. Plant enough to share. This is a pretty simple concept for vegetable and herb growers, or if you have fruit trees that are accessible. I am not a fan of fencing off my gardens, I enjoy talking with my neighbors and people passing by about what I'm growing. I've had more than one person stop in to say that they tried gardening in their tiny urban front yards after they saw mine. When folks stop by, they often go home with some seeds, a couple of plants, or some produce from the garden. If some produce disappears, I chalk it up to one more person who might learn that the home-grown stuff tastes better than what we can get at the store, and they may be inspired. I usually seed 2-3 times as many pots or trays as I personally can use and plant a lot more produce than my small household can keep up with. I've found that generosity builds community and I've been messed with less than when the garden is locked up tight.

2. Practice mutual aid. This harkens back to being generous. If you are gardening, share that skill with others. This can be through simple conversation,

# What's Bugging You?
# Two-Legged Pests-Humans (*Homo sapiens*)

volunteering with one of the many garden-centric non-profits or garden clubs around, or even social media. Gardening can be intimidating for folks, but a little help and encouragement goes a long way. Mutual aid means giving assistance regardless of social need or status. If someone needs help, help them freely. Send them home with some seeds and a little potting soil. Offer to swing by and check out their plants or have them send photos to you. During covid, I set up a free seed library and plant table to make some basic supplies available 24/7, which eliminated theft in the garden almost completely.


Anna's seed library includes soil test kits and informative growing guides.

3. Engage with community garden projects. There are a growing number of school and community garden spaces popping up nationwide. Covid sped up this trend, with more public garden spaces, both official and unofficial, than ever before. There are now more gardens, both personal and public, than even during the Victory Garden movement of WWII. Find out if there is a garden you can help with near you and donate an afternoon here and there to help provide produce for the community, or to simply beautify it.


Anna's neighbors are greeted with this friendly sign.

4. Manage expectations. Sometimes no matter what you do, people will cross boundaries and take from our gardens, orchards, and yards. It's a bummer, but hopefully those plants or that produce inspires someone else to get growing. Hey, it happens.

~Anna Timmerman

# Black Rot of Crucifers

The cooler weather has arrived and our cool season veggies are looking nice. Harvest off the earlier planted ones has already begun. Hopefully, you're keeping the pests and diseases at bay with good IPM practices; making sure your plants have plenty of nutrients available, getting the right amount of sunshine, getting sufficient water but growing in well-drained soil, keeping weeds down to prevent competition and reduce insect and disease incidence.

Figure 1: Typical V-shaped lesion due to black rot on cabbage leaf.

Many of our cool season vegetables are in the Brassicaceae family also known as crucifers. This would be cabbage, kale, broccoli, cauliflower, Brussels sprouts, kohlrabi, turnips, collards, mustard, rutabaga, Bok choy, etc. If you have some of these in your garden, and I hope you do, then keep an eye out for the most serious disease of crucifer crops worldwide. I'm talking about black rot, caused by the bacterium *Xanthomonas campestris* pv. *campestris*. The disease is also known as blight, black stem, black vein, stem rot and stump rot. All crucifers are susceptible to *Xanthomonas campestris* pv. *campestris*, with radish and kale a little more tolerant than the others.

Figure 2: Vascular tissue discoloration due to *Xanthomonas campestris pv. campestris* infection.

Susceptible plants can become infected in two ways. *Xanthomonas campestris* pv. *campestris* can be a seedborne disease that leads to systemic infection. Seedlings that are infected systemically become yellow, drop lower leaves, and may die. These symptoms are often attributed to nutritional problems. Dark spots and blackened veins sometimes develop on cotyledons. Plants that are infected systemically because of contaminated seed may not develop symptoms for many weeks after emergence.

The classic symptom of black rot is caused by local infection when bacteria enter leaves through hydathodes (natural openings at leaf margins). The infected tissue is wilted and pale green, becomes yellow, then turns brown and dies. Affected areas are usually wedge- or V-shaped when bacteria enter leaves through hydathodes. These areas enlarge as the disease progresses, and severely affected leaves may

# Black Rot of Crucifers

fall off. Bacteria can also enter leaves through wounds caused by insects, wind, harvesting or mechanical damage. The veins in infected leaves, stems, and roots sometimes become black because the bacteria produce an extracellular polysaccharide that plugs normal water flow.

The primary sources of bacterial infection are from infected seed, infected Brassicaceae weeds and infected transplants. *Xanthomonas campestris* pv. *campestris* can survive in plant debris until it is completely decomposed and survive free-living in soil for 40-60 days.

Bacteria are spread from infected plants to uninfected plants primarily by wind-blown and splashing water and by people, machinery, and occasionally insects such as flea beetles. Warm, wet conditions favor black rot disease and symptom development. Rain and heavy fogs or dews and day temperatures of 75° to 95°F are most favorable. Under cool, wet conditions infection can occur without development of symptoms. The bacteria do not spread below 50°F or during dry weather.

Figure 3: Heavily infected cabbage leaf.

There are several approaches to use to prevent and control black rot. The first is to use resistant varieties. This is especially important if you have had black rot previously. Seed catalogs will tell you what varieties they sell that are resistant.

Always use certified disease-free seed if you are starting your own plants. Always use sterile potting medium to start your seedlings as well. Making sure you start disease free is one of the easiest and surest ways to prevent black rot disease.

Plant crucifers in well-drained locations and plant in areas that haven't had crucifers grown in them for at least two years prior. Crop rotation is a great way to help prevent many plant diseases.

Check your plants regularly and remove any infected seedlings/plants immediately. Remove plant debris and mulch around your plants. Removal of infected plant material on plants that aren't systemically infected can reduce disease incidence.

Control insects and weeds, especially, cruciferous weeds.

Avoid overhead irrigation. Overhead irrigation can lead to splash infections and wet plants are more susceptible to infection.

The effectiveness of chemical control for black rot has been inconsistent in trials over the years. However, use of copper sprays as a protectant to prevent spread of disease is somewhat effective and often recommended.

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~Dr. Joe Willis

# Sweetening the Soil: A Review of Liming Acidic Soils to Raise Soil pH

**What is soil acidity?**

The degree of acidity or alkalinity in a soil is referred to as soil pH and can affect a wide range of both chemical and biological properties of a soil. Soil pH has a big influence on the availability of plant nutrients and the activity of soil microorganisms. Adjusting and fine tuning your soil pH is one of the most beneficial practices that can be done in the home landscape.

Soil pH is defined as the negative logarithm of the hydrogen ion concentration. If you can remember back in high school chemistry class, the element hydrogen has an atomic number of one which means that it has one proton. Protons are associated with a positive charge while electrons are associated with a negative charge. When atoms either lose or gain an electron they become charged ions. Ions with positive charges are called cations and those with negative charges are referred to as anions. In the case of soil pH, we are particularly interested in the cation, ($H^+$) and its concentration in the soil-water solution. Acidic soils produce a soil pH below 7 and basic (or alkaline) soil produce a pH above 7 on the traditional pH scale. Acidic soils, like much of what we see in Louisiana, can have a negative impact on soil fertility because the higher concentration of $H^+$ ions dilute the cation exchanges sites, or areas associated with a negative charge that attract cations, effectively outcompeting other cations associated with plant nutrition.

**$H^+$ cations originate from a couple of different sources.**

To better understand where the $H^+$ cations come from let's take a moment to review some chemistry. When an acid is mixed with pure water it ionizes to $H^+$ and the accompanying anions. Strong acids like hydrochloric acid (HCl) completely dissociate (or break up) into their respective ions ($H^+$ and $Cl^-$) therefore adding a significant amount of $H^+$ ions to the water solution. Weak acids like acetic acid ($CH_3COOH$) only dissociate partially. Pure water $H_2O$ dissociates into $H^+$ and $OH^-$, making it a weak acid (and a weak base; $OH^-$ concentration is a way to measure how basic a solution is) at the same time. Now, think about when it rains. Atmospheric $CO_2$ mixes with pure water and dissociates partially into $H^+$ and $HCO_3^-$ ions. Pure water in equilibrium with atmospheric carbon dioxide produces a pH of 5.7, making rainfall a natural source of soil acidity! The level of acidity can be higher in areas with intense industrial activity due to greater pollutant load in the atmosphere.

Soil microbes also influence the amount of hydrogen ions within the soil-water solution. Remember the four components of soil: air, water, mineral particles, and organic matter (OM). As microorganisms decompose OM within the top layer of soil, they release $CO_2$ as a byproduct and that $CO_2$ reacts with water in the soil (referred to as soil-water solution). OM decomposition, along with plant root respiration increase the $CO_2$ concentration in the soil-air ten times that of the $CO_2$ concentration in the atmosphere. This can be a major factor on the degree of acidity in a specific soil. There are other ways that can affect the hydrogen ion concentration such as nutrient transformation, nutrient uptake, nutrient leaching, and even the use of specific fertilizers.

**Soils resist changes in pH due to buffer capacity.**

Soil can act like a buffer to resist changes in soil pH. Taking another trip down memory lane to high chemistry class, one must recall that buffer capacity is the amount of acid or base a solution can soak up before a change in pH is observed. This is important in managing acidic soils for optimum plant growth. In high pH soils, calcium, magnesium, potassium oxides, and carbonates help to buffer against changes in soil pH. In acidic soils, aluminum oxides and iron hydroxides act as the buffering agent. The buffering capacity of a soil must be overcome to see a change in soil pH.

To further understand buffering capacity of a soil it is helpful to look at active and potential acidity. Active acidity describes the $H^+$ (and $Al^{+3}$, see aluminum hydrolysis below) concentration in the soil-water

# Sweetening the Soil: A Review of Liming Acidic Soils to Raise Soil pH

solution. This is what is measured when you submit a soil sample to the LSU AgCenter Soil Testing and Plant Analysis Lab. Lab technicians take soil and combine it with deionized water (1:1 ratio), let it sit for several hours to come to equilibrium, and then take a reading using a pH meter and glass electrode. Potential acidity refers to $H^+$ (and $Al^{+3}$) bound to cation exchange sites. These ions may be released (desorbed is the actual terminology) from the cation exchange site into the soil solution when a liming agent is applied to the system.


Figure 1. Agricultural limestone.

**Neutralize hydrogen with lime.**

Liming a soil neutralizes hydrogen ions within the soil-water solution with the addition of a base (such as $OH^-$ or $HCO_3^-$). Agricultural limestone (calcium carbonate; $CaCO_3$) is a common liming material available to home gardeners. When applied to a soil it can neutralize hydrogen ions and, if enough is applied, can raise the pH of an acidic soil. This characteristic can be explained by describing two reactions that occur in an acidic soil when agricultural limestone is applied. $CaCO_3$ neutralizes hydrogen ions through the following reaction.


Figure 2. Pelletized limestone.

$$CaCO_3 + 2H^+ \leftrightarrow Ca^{+2} + CO_2 + H_2O$$

When $CaCO_3$ combines with water in dissociates into $Ca^{+2}$ and $CO_3^{-2}$. Quickly, the $CO_3^{-2}$ neutralizes $H^+$ in the soil solution. Recalling potential acidity occurs as exchangeable $Al^{+3}$. In an effort to buffer a change in pH, an aluminum cation ($Al^{+3}$) is released form the cation exchange site where it reacts with water and produces 6 $H^+$ ions and is precipitated out of solution as $Al(OH)_3$.

$$2Al^{+3} + 6H_2O \leftrightarrow 2Al(OH)_3 + 6H^+$$

However, those 6 $H^+$ ions are neutralized by the $CO_3^{-2}$ from the original application of agricultural lime to the soil.

$$3CO_3^{-2} + 6H^+ \leftrightarrow 3CO_2 + 3H_2O$$

As long as there is enough $CaCO_3^{-2}$ available, $H^+$ ions will be converted into water. The continued removal of $H^+$ ions from the soil solution will eventually result in an increase in soil pH.

**Liming materials.**

Agricultural lime (ag lime) is a common liming material used in agriculture and it contains $CaCO_3$. It is manufactured from natural rock deposits and ground to a fine powder (see figure 1). Dolomitic limestone contains both $CaCO_3$ and $MgCO_3$ and is produced in the same way. Remember that for when you have a scenario where lime is required, and magnesium is deficient. There are other liming materials available such as burned lime, hydrated lime, basic slag, marl, and wood ashes. However, ag lime and dolomitic lime will be easy to find at home improvement centers, local garden centers, and feed stores. Pelletized lime is becoming more and more common with home gardeners. It is made up of finely ground agricultural

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lime particles made into pellets by mixing in lignosulfonates as a binder agent (see figure 2). It can contain $CaCO_3$, $MgCO_3$, or both depending on the parent lime material.

To compare different lime products, one must evaluate the purity and particle size of the lime product. The purity of a liming product is determined in relation to pure calcium carbonate and is expressed as the calcium carbonate equivalent (CCE). Particle size refers to the relative size of the individual particles and is expressed as the percentage of liming material that passes through various sized screens. The finer the particle, the more efficient it will be at neutralizing soil acidity. However, liming materials with a good distribution of different sized particles can raise soil pH quickly with fine particles and sustain that raise as the coarser particles break down.

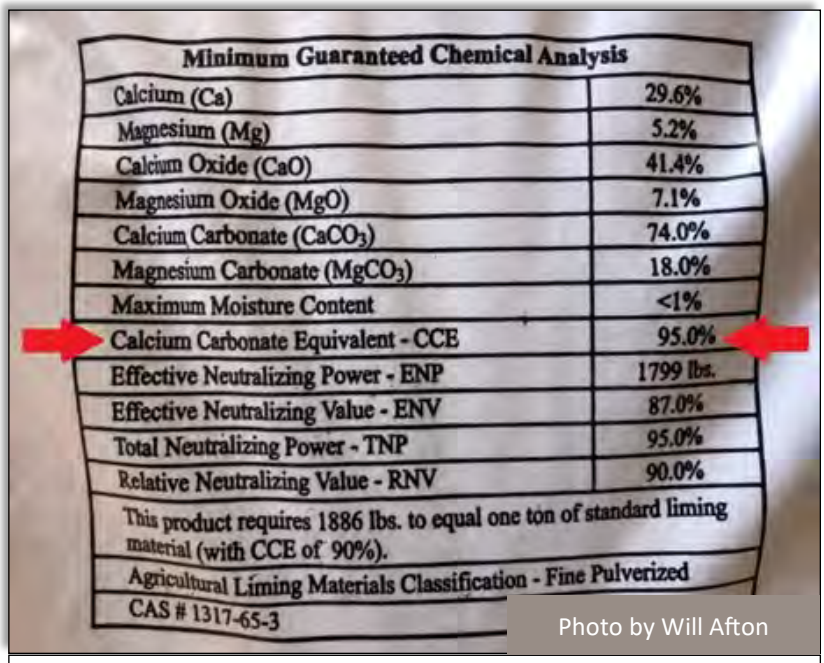


Figure 3. Calcium carbonate equivalent (CCE) values can be found on the backside of the product packaging.

There has been much debate and discussion on whether or not pelletized lime products neutralizes soil acidity at a quicker rate and requires less material than traditional agricultural lime. Contrary to urban myth, the speed at which pelletized lime neutralizes soil acidity is no faster than traditional agricultural lime and the amount needed is based off the CCE of the pelletized lime product, which is the same protocol for using traditional agricultural lime!

**Liming your soil.**

In areas with historically low soil pH readings like St Tammany Parish, a lot of folks blindly applied lime to the soil every couple of years because they saw an improvement in plant growth. This technique worked well for many generations, but as new technology made its way to agricultural fields, and now home landscapes, they are more accurate ways of testing and adjusting soil pH conditions. The LSU AgCenter Soil Testing and Plant Analysis Lab (STPAL) should be well known entity with everyone who works with plants. The routine soil sample testing package provides everything you need to address not only plant nutrition issues, but also soil pH issues. One of the pieces of information that it provides is a soil pH reading using commercial laboratory equipment. If the soil pH is determined to be too acidic for the chosen plant (or crop to be grown suggestion), then the results page with provide the user with a liming rate to apply to their soil.

The rate will show an amount of product to be distributed evenly over a given area. Some common area units seen are acres (43,560 $ft^2$), 1000 $ft^2$, and 100 $ft^2$. Use the rate to determine how much of the product is needed by extrapolating the liming rate. The LSU AgCenter STPAL reports their liming rates using a product with a CCE value of 100%. Not all liming products are created equal with regards to CCE values with most ranging between 80 and 95% CCE. This information is usually found on the back of the bag (figure 3). Depending on the product chosen you may need to apply more product than what the soil analysis requests. For example, a soil test provides a liming rate of 6.88 lbs. of lime per 100 $ft^2$. That rate is using a liming product with a CCE value of 100%. A pelletized

# Sweetening the Soil: A Review of Liming Acidic Soils to Raise Soil pH

| Product | CCE | Parent material | Manufacturer | Location |
|---|---|---|---|---|
| Agricultural Limestone | 109% | $CaCO_3 + MgCO_3$ | Hi-Yield | Okeefe's Feed |
| Pro-Cal Pellets | 95% | $CaCO_3$ | Austinville Limestone | Okeefe's Feed |
| Gardenlime | 95% | $CaCO_3$ | Austinville Limestone | Lowe's |
| Pelletized Lawn Lime | 95% | $CaCO_3$ | Austinville Limestone | Lowe's |
| Fast Acting Lime | 91% | $CaCO_3$ | Sta-Green | Lowe's |

CCE value of several commonly available liming products.

liming product purchased from the feed store displays a CCE value of 85%. You would need to adjust the application rate of the purchase product to 7.9 lbs. per 100 $ft^2$ due to it having a lower CCE value. This can go the other way too. Some dolomitic products may have CCE values higher than 100 because they are efficient at neutralizing acidity and would theoretically require less than the rate recommended by the soil test.

A recent survey was compiled after visiting a local independent feed store and a popular home improvement store in the Covington area. Several different liming products were found and the CCE values ranged between 90 and 109% (table 1).

Lastly, lime should be applied using a fertilizer spreader. There are two common types of fertilizer spreaders on the market an either will get the job done. Drop spreaders release their contents in a line directly between the wheels of the device. Broadcast spreaders cover much more area by throwing the contents in swatch of up to 15ft. Whatever type of spreader used, it is recommended to calibrate the spreader to know exactly how much liming product is applied over a known area. An easy way around this is to determine the total amount of liming material needed to treat the area by extrapolating from rate provided by a soil test and adjusting as needed for difference in CCE.

Once you determine how much lime is needed, the task at hand is to apply the lime as accurately and as evenly as possible. A common method for applying lime is to place the spreader on a low setting with small exit holes. You can then load the reservoir with the total amount and walk in a methodical style back and forth over the entire area until all the product has been applied.

Soil acidity and liming to manage it sounds like a dreadful task in the garden. Accented with strange words, odd symbols, and scary numbers, it is a very important aspect of growing plants and plant enthusiasts should be made aware. Inform yourself and start taking soil tests to determine the current soil pH status. You can always reach out to your local extension office to double check your calculations or ask for help.

**Resources**

Brady, C. and R. Weil. 2008. The nature and property of soils. 14th ed. Pearson Education, Upper Saddle River, New Jersey.

Havlin, J., J. Beaton, S. Tisdale, and W. Nelson. 2005. Soil fertility and fertilizers. 7th ed. Pearson Education, Upper Saddle River, New Jersey.

Murdoch, L. 1997. Pelletized lime – how quickly does it react. University of KY. Soil Science News and Views 18:9.

Parvej, R., B. Tubana, and J. Wang. 2021. Soil liming and lime qualities. LSU AgCenter. Louisiana Crops Newsletter 11:8.

~Will Afton

# Farmers Markets in the GNO Area

## Orleans Parish

Crescent City Farmer's Market- Mid-City
500 N. Norman C. Francis
Thursdays from 3-7PM
Walk-up and curbside pre-orders at
www.crescentcityfarmersmarket.org

Crescent City Farmer's Market- City Park
Tad Gormley Stadium parking lot at Marconi and Navarre
Sundays from 8AM-Noon
Preorder contact-free drive through only, info at
www.crescentcityfarmersmarket.org

Crescent City Farmer's Market- Uptown
200 Broadway
Tuesdays from 8AM-Noon
Walk-up and curbside pre-orders, info at
www.crescentcityfarmersmarket.org

SPROUT NOLA ReFresh Market-Truck Farm Table
200 N. Broad (In Whole Foods lobby or in parking lot, weather permitting)
Walk up

SPROUT NOLA ReFresh Market-Lafitte Greenway
2606 St. Louis
Mondays from 3-6PM
Walk up and pre-orders at https://app.sourcewhatsgood.com/markets/refresh-farmers-market/products

Vietnamese Farmer's Market
14401 Alcee Fortier Blvd., New Orleans East
Saturdays, 5:30AM-8:30AM

Marketplace at Armstrong Park
901 N. Rampart
Thursdays from 3-7PM

New Orleans French Market
Lower Decatur Street
Daily, 9AM-6PM

Know Dat Grow Dat Microgreens & Produce
Online Sales
https://www.knowdatgrowdat.com/shop

Mid-City Arts and Farmer's Market
Comiskey Park, New Orleans
Market dates vary and are on hold due to Covid-19, check http://midcityaf.org

Laughing Buddha Farm Hubs
Pick up points vary, pre-orders available
Bywater, Broadmoor, Lakeview, Irish Channel, Mid-City, Algiers Point, Uptown Locations
https://www.laughingbuddhanursery.com/events

Barcelo Gardens Farmer's Market- Upper 9th Ward
2301 Gallier Street
Saturdays from 10AM-1PM

Bywater Market at Trap Kitchen-Bywater
1043 Poland Ave
Sundays from 10AM-3PM

Paradigm Farmer's Market-Central City
1131 S. Rampart
Sundays 9AM-Noon

Lot 1701 Small Business and Farmer's Market-Central City
1701 Oretha Castle Haley Blvd.
Every 1st and 3rd Saturday from 11AM to 3PM

BOUNYFUL Farmer's Market-Algiers Point
149 Delaronde St.
First and Third Sundays of the month, from 11AM-3PM

Edgewood Park Market-Edgewood
3317 Franklin Ave.
First market Sunday, May 2nd from 11AM-3PM

New Orleans East Hospital Farmer's Market- New Orleans East
5620 Read Blvd.
First Tuesday of the Month- 3PM-Dusk
Third Thursday of the Month- Noon-3PM

Sheaux Fresh Sustainable Foods- Treme-Laffite
585 N. Claiborne at Lafitte Greenway (under overpass)
Wednesdays from 2-5PM
Saturdays from 10AM-2PM
Check for current dates/times at www.sheauxfresh.org

Holy Cross Farmer's Market- Holy Cross/Lower 9th Ward
533 St. Maurice
First & Third Saturday of the month, 10:00AM-2PM

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## St. Charles Parish

German Coast Farmer's Market at Westbank Bridge Park-Luling
13825 River Road
Wednesdays, from 1-5PM

German Coast Farmer's Market at Ormond Plantation-Destrehan
13786 River Road
Saturdays, from 8AM-Noon

# Farmers Markets in the GNO Area

**Jefferson Parish**

Gretna Farmer's Market
739 Third Street, Gretna
Every Saturday, except the Saturday of Gretna Fest,
8:30AM-12:30PM

Nawlins Outdoor Market
1048 Scotsdale Dr., Harvey
Every Saturday & Sunday, 9AM-5PM

Old Metairie Farmer's Market
Bayou Metairie Park, Between Metairie Lawn Dr. and Labarre
3rd Tuesday of the month, 3:30PM-7:30PM

Westwego Shrimp Lot
100 Westbank Expressway at Louisiana St., Westwego
Daily Mon-Thurs 8AM-6PM, Fri 8AM-7PM, Sat 7AM-7PM,
and Sun 7AM-6PM

Lafreniere Park Market-Metairie
3000 Downs Blvd.
Wednesdays, from 3-7PM

Laughing Buddha Farm Hub-Clearview
4516 Clearview
Store Pickups, preorder online at https://
www.laughingbuddhanursery.com/buy-groceries-1

Jean Lafitte Town Market-Lafitte
920 Jean Lafitte Blvd.
Last Saturday of the month, 9AM-1PM

Harahan Farmer's Market
6437 Jefferson Hwy., Harahan, LA
Sundays, Noon-4PM

Good Time Guild Farmer's Market at St. Martin's Episcopal Church-Metairie
2216Metairie Rd.
1st Thursdays monthly, 2PM-7PM
3rd Saturday monthly, 10AM-3PM

# Local Independent Garden Centers

| | | |
|---|---|---|
| **Orleans** | | |
| Urban Roots | 2375 Tchoupitoulas St., New Orleans, LA 70130 | (504) 522-4949 |
| The Plant Gallery | 9401 Airline Hwy., New Orleans, LA 70118 | (504) 488-8887 |
| Harold's Plants | 1135 Press St., New Orleans, LA 70117 | (504) 947-7554 |
| We Bite Rare and Unusual Plants | 1225 Mandeville St., New Orleans, LA 70117 | (504) 380-4628 |
| Hot Plants | 1715 Feliciana St., New Orleans, LA 70117 | www.hotplantsnursery.com |
| Delta Floral Native Plants | 2710 Touro St., New Orleans LA 70117 | (504) 577-4290 |
| Pelican Greenhouse Sales | 2 Celebration Dr., New Orleans, LA 70124 | ( 504) 483-9437 |
| Grow Wiser Garden Supply | 2109 Decatur St., New Orleans, LA 70116 | (504) 644-4713 |
| Jefferson Feed Mid-City | 309 N. Carrollton Ave., New Orleans, LA 70119 | (504) 488-8118 |
| Jefferson Feed Uptown | 6047 Magazine St., New Orleans, LA 70118 | (504) 218-4220 |
| Ninth Ward Nursery | 2641 Deslonde St., New Orleans, LA 70117 | (504) 296-8398 |
| Crazy Plant Bae | 800 N. Claiborne Ave., New Orleans LA 70119 | (504) 327-7008 |
| Canopy Plant Company | 6030 St. Claude, New Orleans, LA 70117 | (504) 381-4033 |
| Too Tall Nursery | 2817 N. Roman, New Orleans, LA 70117 | tootallfarm@gmail.com |
| Nice Plants Good Pots | Pop Up and Online Sales | Etsy.com/shop/NicePlantsGoodPots |
| Plantery NOLA | Pop Up Locations | www.planterynola.com |
| Canopy Plant Co. | Pop Up and Online Sales | www.canopyplantco.com |
| New Orleans Succulent Boutique | Online Sales | https://sites.google.com/view/nolasucculentshop/home |
| Root Life Mobile Plant Nursery | Pop Up Locations | https://rootlifeplantnursery.com/ |
| New Orleans Green LLC | www.neworleans-green.com | |
| **Plaquemines** | | |
| Southern Gateway Garden Center | 107 Timber Ridge St., Belle Chasse, LA 70037 | (504) 393-9300 |
| Belle Danse Orchids | 14079 Belle Chasse Hwy., Belle Chasse, LA 70037 | (504) 419-5416 |
| **St. Charles** | | |
| Plant & Palm Tropical Outlet | 10018 River Rd., St. Rose, LA 70087 | (504) 468-7256 |
| Martin's Nursery & Landscape | 320 3rd St., Luling, LA 70070 | (985) 785-6165 |
| **St. Bernard** | | |
| Renaissance Gardens | 9123 W. Judge Perez Dr., Chalmette, LA 70043 | (504) 682-9911 |
| Plant Pricks | Pop Up Locations | https://plantpricks.com/ |

# Local Independent Garden Centers

**Jefferson**

| | | |
|---|---|---|
| Perino's Garden Center | 3100 Veterans Memorial Blvd., Metairie, LA 70002 | (504) 834-7888 |
| Rose Garden Center | 4005 Westbank Expressway, Marerro, LA 70072 | (504) 341-5664 |
| Rose Garden Center | 5420 Lapalco Blvd., Marrero, LA 70072 | (504) 347-8777 |
| Banting's Nursery | 3425 River Rd., Bridge City, LA 70094 | (504) 436-4343 |
| Jefferson Feed | 4421 Jefferson Hwy., Jefferson, LA 70121 | (504) 733-8572 |
| Nine Mile Point Plant Nursery | 2141 River Rd., Westwego, LA 70094 | (504) 436-4915 |
| Palm Garden Depot | 351 Hickory Ave., Harahan, LA 70123 | (504) 305-6170 |
| Double M Feed Harahan | 8400 Jefferson Hwy., Harahan, LA 70123 | (504) 738-5007 |
| Double M Feed Metairie | 3212 W. Esplanade Ave., Metairie, LA 70002 | (504) 835-9800 |
| Double M Feed Terrytown | 543 Holmes Blvd., Terrytown, LA 70056 | (504) 361-4405 |
| Sunrise Trading Co. Inc. | 42 3rd St., Kenner, LA 70062 | (504) 469-0077 |
| Laughing Buddha Garden Center | 4516 Clearview Pkwy., Metairie, LA 70006 | (504) 887-4336 |
| Creative Gardens & Landscape | 2309 Manhattan Blvd., Harvey, LA 70058 | (504) 367-9099 |
| Charvet's Garden Center | 4511 Clearview Parkway, Metairie, LA 70006 | (504) 888-7700 |
| Barber Laboratories Native Plants | 6444 Jefferson Hwy., Harahan, LA 70123 | (504) 739-5715 |
| Plumeria Insanity Nursery | https://www.facebook.com/Plumeria-Insanity-Nursery-102123651930419 | |

**Soil Vendors**

| | | |
|---|---|---|
| Schmelly's Dirt Farm | 8301 Olive St., New Orleans, LA 70118 | (504) 535-GROW |
| Laughing Buddha Garden Center | 4516 Clearview Pkwy., Metairie, LA 70006 | (504) 887-433 |
| Reliable Soil | 725 Reverand Richard Wilson Dr., Kenner, LA 70062 | (504) 467-1078 |
| Renaissance Gardens | 9123 W. Judge Perez Dr., Chalmette, LA 70043 | (504) 682-9911 |
| Rock n' Soil NOLA | 9119 Airline Hwy., New Orleans, LA 70118 | (504) 488-0908 |
| Grow Wiser Garden Supply | 2109 Decatur St., New Orleans, LA 70116 | (504) 644-4713 |

**If you would like your licensed retail nursery listed, please email gnogardening@agcenter.lsu.edu**

# In the Kitchen with Austin

## Carrot Salad

The holidays make me feel nostalgic. I've always loved cooking, so as a child the adults would give me jobs like cracking pecans, shelling beans, and grating carrots. This recipe opens the door for all those childhood memories to flood in, and grating the carrots is about the hardest part of it.

**Ingredients:**

1 lb. of freshly grated carrots
¾ cup raisins
1 large apple, cored and chopped
⅓ cup mayonnaise

**Directions:**

Combine the carrots, raisins, apple and mayonnaise in a bowl. Gently stir to combine ingredients.

Cover and refrigerate until ready to serve.

*Bon Manger!*

# December Checklist/Garden Tips

Don't forget to add nature's generous bounty of leaves provided this time of year to your compost piles, or use them to mulch shrub and flower beds. You should have a 3-4 inch mulch layer over your garden soil. Mulch insulates the soil, keeps the soil moisture consistent, helps prevent plant disease and neatens everything up. Shred larger leaves with your lawn mower before adding them to the compost pile or using them as mulch. Stock pile pine straw and cypress leaves in plastic bags to use to cover low growing plants for freeze protection. Use the wand of your vacuum cleaner to remove the air from the bags to compress the material to save space. See a demonstration at the following link: https://www.facebook.com/1030624690304124/videos/3299251646811530/

You can also make your own home-made baler to make your own bales of pine straw and cypress leaves for future use. See my demonstration video at the following link: https://www.youtube.com/watch?v=Fb8v9SXUAFg&t=7s

Winterize your garden tools before you put them away. Clean and sharpen tools, apply a thin layer of protective oil to the blades, and coat wooden handles with sealer, tung oil or varnish to protect the wood and keep it in good shape. Drain the gas from lawn mowers and other gas powered equipment (see the owner's manual for recommendations).

Poinsettias are a great addition to interior holiday displays, place them near a window to give them a longer "shelf-life". Wait to water them until the soil feels dry to the touch.

If you bought tulip or hyacinth bulbs last month, plant them at the end of December. If you want to have hyacinths blooming indoors, plant them halfway into a shallow bowl with pebbles or marbles in the bottom. Add just enough water so that the bottom of the blubs stay wet, adding water when it stops making contact. Place them someplace sunny. It takes four to six weeks for them to bloom, bringing a welcome jolt of spring into the house.

If we get a hard freeze, wait a few days to evaluate the damage. Many cole crops will bounce back, as will some landscape plants. Things usually look worse the next morning after a frost than they actually are. Waiting gives the plants a chance to recover, and you can see the extent of the true damage. Prune cannas, philodendrons, clerodendrums, and gingers back to the ground that got burned. They will be back in the spring.

Many garden chemicals are water based and can be destroyed by freezing. The loss of chemicals can be expensive and spilled chemicals can create dangerous conditions. Keep chemicals in a location that doesn't freeze, and if there are children in the house, they should be stored in a locked location.

Cut back any lingering tropical milkweed (Asclepias curassavica) to encourage Monarch butterflies to migrate south. Cut the plants back to the ground if possible, they will be back in the spring just in time for the return of the butterflies.

Consider creating holiday arrangements and centerpieces using plant material from your yard and gardens. Many of our most common landscape plants make excellent seasonal greenery, including magnolias, nandina, hollies, juniper, cypress, and camellias. Cut some greenery and spend some time creating arrangements for your table or mantelpiece. This can be a fun holiday activity to share with family members. The fragrance of evergreens also adds to the seasonal ambiance!

If you have any of the holiday cacti, including Thanksgiving, Christmas and Easter cacti, be sure to put it on display. Once the blooms finish, place it in a sunny window to recover and prepare for next year's flowering. Allow the soil to dry out between all waterings. Prolonged soil moisture can rot the roots. Fertilize lightly with a little water-soluble fertilizer once a month to keep it happy.

Plant cool season bedding plants now, and be sure to keep them deadheaded so that they bloom well into the spring months. Great things to plant now include snapdragons, foxgloves, dianthus, pansies, petunias, violas, columbine, delphinium, and cyclamen.

# Lawn Care Do's & Don't's

## Do's:

1. You may apply selective herbicides to eliminate broad leaf weeds in the lawn.
2. Cool damp weather is ideal for the appearance of Large Patch Disease in your lawn. Click here to find information about large patch disease from the LSU AgCenter.
3. Mulch fall leaves and let them decompose in place if possible or collect them with a bagging mower and add them to your compost pile or use them as mulch in your gardens.
4. Take a soil test. Test kits are available in our offices in the Botanical Gardens, the Yenni Building, and New Orleans City Hall as well as local garden centers. Follow this link to see Dr. Joe demonstrate how to take a soil sample: https://www.facebook.com/1030624690304124/videos/1452161988150390/

## Don't's

1. Do not spread fill over the lawn until it is actively growing again in the spring.
2. Do not apply fertilizer to the lawn again until April of next year.
3. Do not apply phosphorous winterizer to the lawn without taking a soil sample first. We have ample amounts of phosphorous in our soil already.
4. Do not attempt to install a new lawn until spring.
5. Do not cut more than 1/3 of the height of lawn grass at a single time.
6. Do not aerate the lawn.
7. Do not dethatch the lawn.


Soil test kits can be picked up at our parish offices and at local garden centers.

## Your Local Extension Office is Here to Help

**E-mail us at: GNOGardening@agcenter.lsu.edu**

**Follow us on Facebook at GNOGardening**

**For more information visit LSUAgCenter.com**


| Dr. Joe Willis | Anna Timmerman | Chris Dunaway | Will Afton |
|---|---|---|---|
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