LOUISIANA Master Gardener™
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THE GARDENGOER

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ST. TAMMANY MASTER GARDENER ASSOCIATION
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VOLUME 25 Issue 4 July/August 2023

Tuesday afternoon
I'm just beginning to see. Now I'm on my way.
It doesn't matter to me. Chasing the clouds away.

Something calls to me.
The trees are calling me near. I've got to find out why.
Those gentle voices I hear. Explain it all with a sigh.

Lyrics by Justin Haywood/Moody Blues

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Photo by J Blazek

For the latest research-based information on just about anything, visit our Web site: www.lsuagcenter.com

Is It Ragweed Or Goldenrod? **Aaaaaachoooo!**

It is that time of the year when lots of wildflowers are blooming, and an estimated 36-50 million Americans are sneezing. But wait! Before you start pulling all those wildflowers out of your pollinator garden … not every one causes seasonal allergies. In fact, goldenrod very rarely does. One of the main culprits, though, can be ragweed. Do you know the difference between the two?

Ragweed

Ambrosia spp. are herbaceous annuals commonly known as ragweed or bursage. In the United States, there are at least 17 different species of ragweed. All are in the aster family and found along roadsides, in grass prairies, agricultural fields, and, of course, our yards and gardens. Ragweed prefers dry sunny places.

It is a small and inconspicuous plant, ranging from one to three feet tall. The plant is branched from the ground up and has coarse, hairy stems. People who are sensitive to the plant can develop a rash by simply touching it. Not to mention that annoying seasonal allergy! Aachoo!

The leaves of ragweed are divided, resembling fern leaves.

Ragweed blooms from June through August and, in warmer climates, into the fall months. The small greenish white spikes of flowers are inconspicuous and do not attract pollinators.

Is It Ragweed Or Goldenrod? continued

Ragweed pollen particles are very small and lightweight. Instead of insect and animal pollinators, ragweed depends on wind dispersion of pollen for fertilization. Being easily borne on the wind, ragweed pollen has been detected as high as two miles up in the atmosphere and 400 miles offshore. Making it ubiquitous and an extremely irritating allergen for those sensitive to it.

Ragweed is native to North America and is considered invasive. It is more easily controlled if uprooted before it blooms. Glyphosates can also control its spread. Use according to package directions. Ragweed propagates both by seed and rhizomes. These seeds are numerous, rich in oil, and are a good food source for birds during winter months.

Native Americans brewed medicinal teas with ragweed leaves to treat swelling, vomiting, and diarrhea. Crushed leaves were rubbed on bug bites. Seeds, which are 47% protein, were harvested by native Americans and used as an important source of oil and food during the winter months.

Modern science has learned that ragweed plants can remove toxic heavy metals, like lead, from the soil to help clean up industrial waste. The mature plants are then removed from the site and burned in an environmentally safe method.

Unfortunately for 15 to 25% of Americans, ragweed can bring on miserable seasonal allergies: sneezing, runny nose, itchy eyes. If you or a family member are highly allergic, it is important to be able to identify ragweed and remove it. But remember, even if it is not in your yard, it is still in the air. After working in the garden, remove your clothes and launder them. Shower to remove the air-borne pollen from your skin and hair. Wipe your dog and cat with a dampened towel to remove pollen after they have been outdoors. This will decrease the amount of ragweed pollen in your home. And hopefully, decrease your allergy symptoms.

Is It Ragweed Or Goldenrod? continued

Goldenrod

But what about goldenrod? Goldenrod, *Solidago spp*., also native to North America, is a member of the aster family, too. Goldenrod has more than 100 different species, all of which are perennials. While it is certainly possible to have a sensitivity to it, especially people who have skin rash reactions to latex, goldenrod usually does not cause seasonal allergy symptoms. The pollen is not airborne.

The goldenrod plant is taller than ragweed, ranging from three to five feet in height. Goldenrod blooms the same time as ragweed, mid-summer through fall. Goldenrod flowers, however, are larger, showy, bright yellow, nectar-filled spears that attract many pollinators, bees, beetles, butterflies, and wasps.

The flowers are pyramid-shaped feathery plumes at the tops of stems. The leaves are green lance-shaped.

The reason goldenrod is less a culprit of seasonal allergen is the nature of its pollen. Goldenrod pollen is a large, sticky, heavy particle that is not wind borne. The plants require pollinators to bring the sticky pollen from flower to flower for fertilization. Because the pollen is not airborne, it is much less likely to cause seasonal allergies except by direct contact with the plant by sensitized individuals. So, if allergic, do not stick your nose in the flower!

Goldenrod grows both in full sun and shade. Flowers are more abundant in full sun. It is drought tolerant. These plants can be found along roadsides, as well as in forests, along with other members of the aster families. They can be propagated by seed or division of clumps.

Goldenrod is showy and has become so popular that ornamentals are being bred and sold in nurseries. Crown of Rays, Fireworks, Golden Baby, Gold Rush, Little Lemon and Solar Cascade are some of the commercially available goldenrod species. These are shorter and less aggressive than their wilder cousins.

Is It Ragweed Or Goldenrod? continued

The above ground parts of goldenrod have been used as an herbal medicine throughout history: as an analgesic, to reduce fevers, for bladder issues, and as an astringent. There are no western medicine scientific studies to support efficacy for these purposes, or those cited for ragweed.


Photo by J Blazek

Summary

	Ragweed	**Goldenrod**
Size	1-3 feet	3-5 feet
Bloom	pale green spikes inconspicuous	bright yellow pyramids showy
Leaves	fern-like	lanceolate
Pollen	small, lightweight	large, sticky, heavy
Cross-pollination	airborne	insect pollinators
Allergen	highly allergenic	rarely allergenic

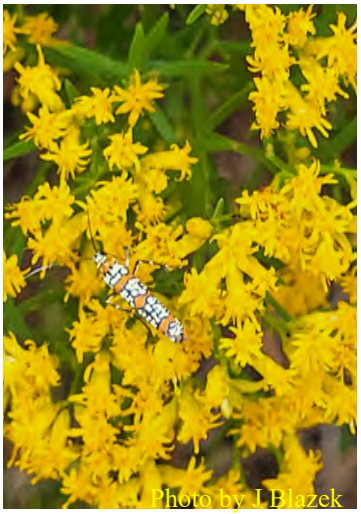


Photo by J Blazek

So, if you are suffering from seasonal allergies, check your pollinator garden. But spare that goldenrod. The culprit is probably ragweed, not goldenrod.

References:

Louisiana Plant ID | Ambrosia sp. (ragweed) (lsu.edu)

Goldenrod Information | Mount Sinai - New York

Don't blame the goldenrod — it's the ragweed! (lsuagcenter.com)

Ambrosia artemisiifolia (Annual ragweed) | Native Plants of North America (wildflower.org)

Common Name - Louisiana Plant ID: Plant List (lsu.edu)

All About Ragweed; the Good and Bad. Melody Rose. August 8, 2015. Davesgarden.com


Photo by J Blazek

Jamie Blazek
Master Gardener
Vegucator
Editor, *The Gardengoer*

Setting Up The 2023 STMGA Plant Sale

The St. Tammany Master Gardener Association's annual Northshore Garden and Plant Sale was April 21 and 22, 2023. It was a great success, thanks as always to the many volunteers who worked before, during, and after the sale.


Photo by S Andres

I have been a master gardener since 2010 and have been involved with the show since the 2011 event. I have unloaded trucks, cleaned bathrooms, spread pine straw to cover wet spots in the arena, provided overnight security, picked up litter, worked Thursday set-up and Saturday clean-up … probably other tasks that I do not remember. This year for the first time I was part of the "Monday before the big event" set-up crew. It was quite an experience!


Photo by S Andres

Peggy Goertz and Pam Peltier, 2010 classmates of mine, are the Set-Up Queens. They sign up our vendors and assign all sites for the show. We began this year at 9:00 in the morning on the Monday prior to the show. A group of eight master gardeners and our county agent, Will Afton, were on-site to begin the task of moving numerous "cow panels" into the configurations that would form the framework for the show.


Photo by S Andres

Paula Brown, Mark Flynn (also a class of 2010 master gardener), John Mendow, Robert Fabacher, John Pollard and I were there to provide the muscle to move and position the panels. Stall sites and aisles were measured and marked off according to instructions from Peggy and Pam. Once that was completed, the floor plan drawings were consulted. These plans directed us as we carried the panels to their designated positions.

Setting Up The 2023 STMGA Plant Sale, continued

Other than Mark's showmanship in a few solo carries, we moved the panels in teams of two. A cumbersome job, but not too difficult. Our set-up was completed in approximately two hours. Not bad considering the size of the arena and the numerous stalls that needed to be assembled.


Photo by S Andres


Photo by S Andres

Pictured below
Front row: Paula Brown, Peggy Goertz
Rear: Mark Flynn, John Pollard, John Mendow, Pam Peltier, Susie Andres, Will Afton, Robert Fabacher

Kudos to Peggy and Pam for their organizational and logistical talents which made the job run smoothly. This little-known but essential part of our pre-show protocol is only one step in delivering a successful plant show each year.


Photo by K Goodwin

Susie Andres
Master Gardener
Slidell Boys & Girls Club, co-chair

Art Scott's Container Garden

I switched to containers for growing my vegetables and herbs because my soil was contaminated with bacterial wilt. Bacterial wilt is deadly to tomatoes and potatoes (first hand experience) and to a lesser extent peppers and eggplants. There is no permanent way to eliminate the bacteria. I even tried waiting for five years and that did not work. Growing vegetables in containers has become my solution. I have used various containers for the past six years.

The containers I currently use are sized 20-gallon to 45-gallon, and a few five-gallon buckets for herbs. Most of the containers are plastic, but I have a few Smart Pots^{Tm}. These fabric pots make it easy to see the internal moisture line as it seeps through the cloth sides. They are predicted to last about five years. So far, they seem to be doing fine.

Right, is a view of the east side of my container garden in early April 2023. It is just after the transplants were placed into the containers. The upside-down bucket is my customized garden stool. The black drip irrigation lines, with a variety of emitters, are visible in the containers.

I made a five-foot tall fence out of horse panel. This prevents the deer from grazing on my veggies. It also keeps out the rabbits. And armadillos can not access the plants and uproot them as they dig for grubs and worms. My Malabar summer spinach is barely visible in the front. Then two containers of Swallow Asian eggplants, two five-gallon buckets with basil and dill followed by another container of eggplants. After the brown PVC support are two banana peppers, then one container of two cherry tomato plants. The row ends with three containers of Celebrity tomato plants.

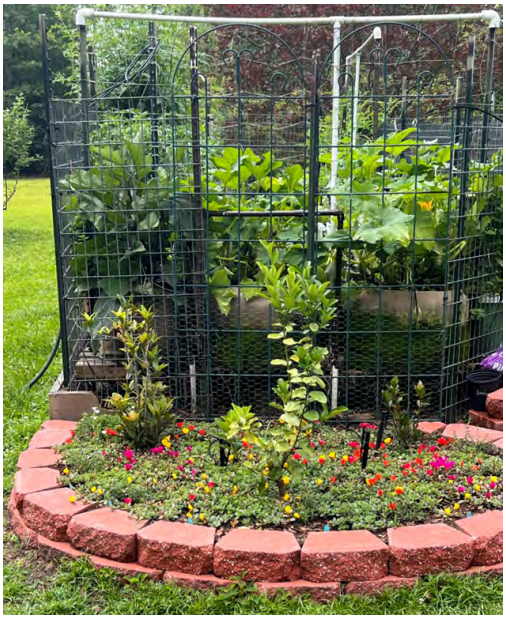
My lemon grass was killed by the freezes. That is the pile of dead foliage to the right outside the fence (above photo). The dead leaves have since been removed and the plant is returning with the warmer weather.

Across the back of the garden (left) is a five-gallon bucket of mint, another of eggplant (20 gallons), then two 45-gallon Smart Pots of yellow squash.

Art Scott's Container Garden, continued

This photo, taken in May, shows the garden in progress. About halfway back on the right, are two cherry tomato plants. In the middle (right) are the yellow squash. The squash plants are across the northern end of the garden (the southern end is in the forefront of the picture).

The plants on the left (west side) are banana peppers and bok choi. Above it in the hay-bale basket is rosemary. Then there is a 20-gallon container of lemon balm. Next is a volunteer cherry tomato plant from last year that is doing very well. Then comes a container dedicated to bok choi, followed by one of kohlrabi. Some Swiss chard followed by cucumbers are next. On the far side of the cucumbers are my purple carrots. The last container (just before the yellow squash across the back) is another eggplant. There is some mint in a five-gallon container next to the yellow squash that reportedly repels the squash vine borer … well, not in my garden.



This end cap (left) is outside the northern end of the garden. The ground cover is purslane. Stems, leaves, and flowers are edible. Purslane is invasive if not controlled. In the back near the fence are two sweet bays, *Laurus nobilis*. The fresh leaves are excellent to cook with instead of dried leaves. In front is a kumquat tree that I stressed in a limiting pot while deciding where to put it.

The swallow eggplants that I am growing are amazing. Very prolific, and if not watched closely, will grow to a huge size. One grew down between the fence and the pot where I did not notice it. It grew to 2-1/2 feet with a considerable girth. Unfortunately, the seeds and the fruit were too tough to eat. I usually harvest these eggplants when they are 8 to 12 inches.

I told Liz, June will be eggplant month. Last night we had three eggplants, sliced 1/8 inch and cooked with chopped banana peppers, a few tomatoes, fresh oregano, cilantro and some dry sherry. Served with some chopped, smoked chicken thighs. Very good! I am looking for as many eggplant recipes as I can find. Got any favorites you want to share?

All photos by A. Scott

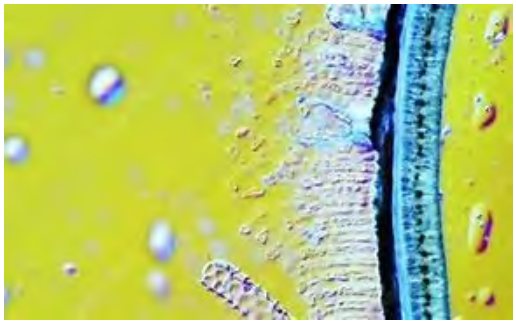
Art Scott
Master Gardener
STMGA Editor, *MoM*

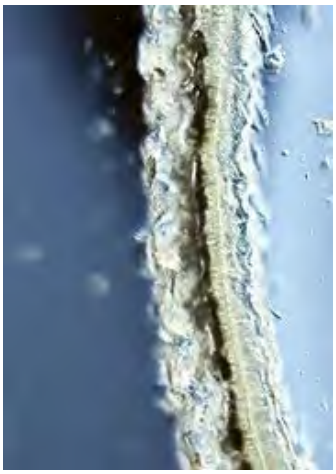
Editor's note: Art wrote comprehensive article detailing how he created his container garden. You can find it on page 24 of this newsletter.

Improving Seed Germination

On May 3, 2023, Elizabeth Berzas, Master Gardener, continued her lecture to the Vegucators on growing vegetables from seed. The first half of the lecture can be found in the May/June 2023 edition of *The Gardengoer*.

Microscopic images of a seed coat (below)





The seed coat protects the seed and prevents it from germinating at the wrong time, such as in a drought or in winter. Before a seed germinates, water must penetrate the seed coat.

Many gardeners just start with yearly seeds, sunshine, a little dirt, and tap water. But germination success rates vary from gardener to gardener. Here are nine ways to improve your germination rates.

Scarification

- In nature, the seed is scraped against something, like sand or rocks in the dirt. Or it can be scarred chemically when it is ingested by an animal and the seed coat is dissolved.
- Use forks, files, emery boards, or nail clippers to scrape the seed.
- Disturb the seed coat, not destroy it.
- Squash, cucumbers, peas, beans and melon seeds are all large enough to hold and scrape.
- Seed coat disruption happens when the seed is exposed to moisture long enough. Water is the great scarifier. Soaking seeds over night is the gold standard for improved germination.
- Chia and mustard are examples of seeds that should be soaked in water prior to planting.

Improving Seed Germination, continued

Use Soapy Water For First Watering

- Liquid dish detergent helps break down waxy seed coats by chemical scarification.
- Add a few drops of dish detergent, such as Dawn, to your watering can.
- Wet potting soil with warm soapy water.
- Plant seeds and cover with appropriate amount of soil.
- Spray top layer of soil with more soapy water.

Soak Seeds In Hydrogen Peroxide

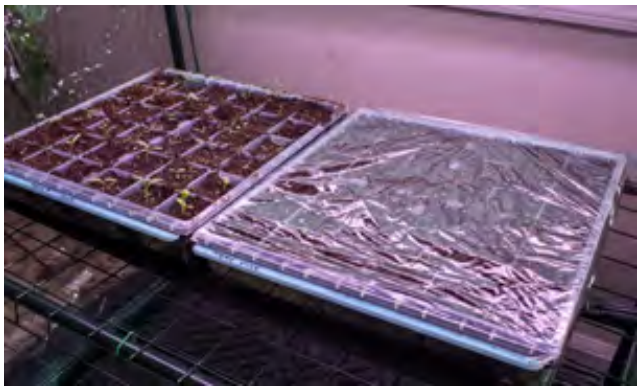
- Hydrogen peroxide (H_2O_2) causes a chemical scarification that breaks down the seed coat and adds oxygen to the water. It is chemically similar to water (H_2O), and breaks down quickly when exposed to air.
- Add 1/4 cup of 1% to 3% hydrogen peroxide to two cups of water to a small container. Do not decrease the amount of water, as this will make the solution too acidic and slow down seedling growth.
- Ice cube trays work well for this purpose.
- Add seeds and soak only 30 minutes. Not longer.
- Then transfer seeds to a water only container to continue soaking overnight.

Hot Water Treament (Water Oven)

- Works best for small seed. Not as effective for large or fragile seeds, pellet seeds, seeds treated to speed germination, fungicide-treated seeds, or old seeds.
- Hot water held to a specific temperature breaks down the seed coating. Temperatures vary with seed type.
- Double-edged sword: speeds up germination but can also lower germination rates.
- Helps prevent seed-borne diseases: black leg, cucumber mosaic virus, Verticillium wilt, Anthracnose and early blight. Only applies to diseases that start in or on the seed.

Improving Seed Germination, continued

Cover To Keep Soil Moist



- Constant drying out and re-wetting soil and seeds can slow down germination.
- As soon as your seeds have germinated, remove the cover to prevent damping off.
- Seeds germinate in the dark, but they need light very quickly thereafter to start photosynthesis.
- Light becomes unnecessary for germination if you can get the heat just right.

Do Not Rely On Windows

- Invest in a good set of grow lights.
- Combine light and heat with one unit.
- Blue or purple lights promote seedling growth.
- Opt for the best full-spectrum grow lights.
- Grow lights should remain in use long after germination begins.

Use A Heating Mat

- Warm soil signifies to plants it is time to grow.
- Warm soil helps prevent dampening off.
- Some seeds need warmer soil to germinate, like peppers which prefer soil around 80 to 85 degrees.
- Heat mat should be UL or ETL listed.
- Choose a mat the allows you to regulate temperature and time.
- Once seeds have germinated, remove mats.

Improving Seed Germination, continued

Plant More Seeds Than Needed

- This helps ensure you have the seedlings you need to transplant outside.
- You can always thin them out later, sell the extras, or give them away.

Cold Stratification

- This process does not speed up or improve anything, but necessary to get some seeds to germinate.
- Mimics seasons: some plants need a cold snap to mimic winter's passage before germinating, like planting spring garlic.
- Most commonly used vegetable seeds do not need to be cold-stratified.

Preventing Disease

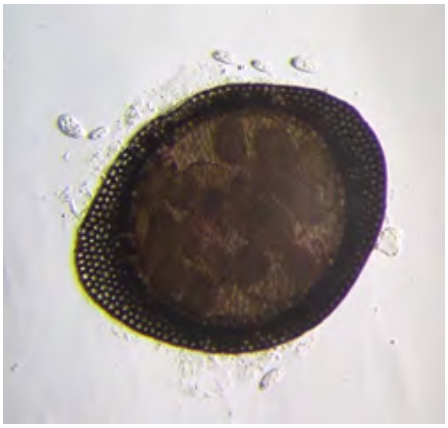


Image of bacteria attacking seed coat

- Bacteria can attach to the outside of the seed coat or be carried within the seed.
- Infected seeds rarely show obvious symptoms of infection.
- Purchase seeds from a reputable supplier.
- Most seed companies will not guarantee disease free seed, but a good seed company will take steps to reduce the chances of seed-borne pathogens.
- If you are planning to save seeds, choose healthy fruit from healthy plants whenever possible.

Improving Seed Germination, continued

Preventing Disease

- Bleach seed treatment
  - Used on any kind of seed, including tomato.
  - Removes pathogens from the surface of the seed coat but not within the seed.
  - Only partially reduces the risk of bacterial canker infection from contaminated seed.
- Hot water seed treatment
  - Eliminates most bacterial plant pathogens from the surface of the seed coat and within the tomato seed.
  - Time and temperature requirements for hot water treatment varies by plant
  - Peas, beans and squash seeds may be seriously injured by hot water treatment.
- Hot water treatment for tomatoes
  - Soak tomato seeds in water heated to 100 F for 10 minutes.
  - Move seed into water heated to 122 F and soak for 25 minutes.
  - Pour seeds through thin meshed sieve or a cheese cloth.
  - Rinse the seed in cool running tap water for five minutes.
  - Critical: exact time and temperature requirements.
  - Seed can be directly planted or dried completely on a screen, then stored.
  - Direct planting after treatment is preferable.

Resources

https://extension.umn.edu/planting-and-growing-guides/saving-vegetable-seeds#start-with-clean-seeds-and-transplants-823212

9 Ways to Improve and Speed Up Seed Germination (ruralsprout.com)

https://www.gardeningknowhow.com/garden-how-to/propagation/seeds/non-hybrid-seeds-vs-hybrid-seeds

https://pddc.wisc.edu/2017/03/03/hot-water-seed-treatment-disease-management

Elizabeth Berzas
Master Gardener
Vegucator

The Power and Science Of Plants

An article on the difference between native, non-native, and invasive plants by the Audubon Society.

https://www.audubon.org/news/what-difference-between-native-non-native-and-invasive-plants


Image from Nola.com


Image from lucidcentral.com

Do your tomato, eggplant, and pepper plants wilt soon after planting them? Here's an article that might explain why this happens.

https://www.theadvertiser.com/story/news/local/louisiana/2023/06/05/southern-bacterial-wilt-is-causing-diseases-n-louisiana-vegetables/70275746007/

Did you know that a dragon fly can eat 100 mosquitoes a day? Forget the mosquito foggers and find out how to attract more dragonflies into your yard.

https://returntonow.net/2022/07/21/dragonflies-eat-hundreds-of-mosquitos-per-day/


Image from blogspot.com

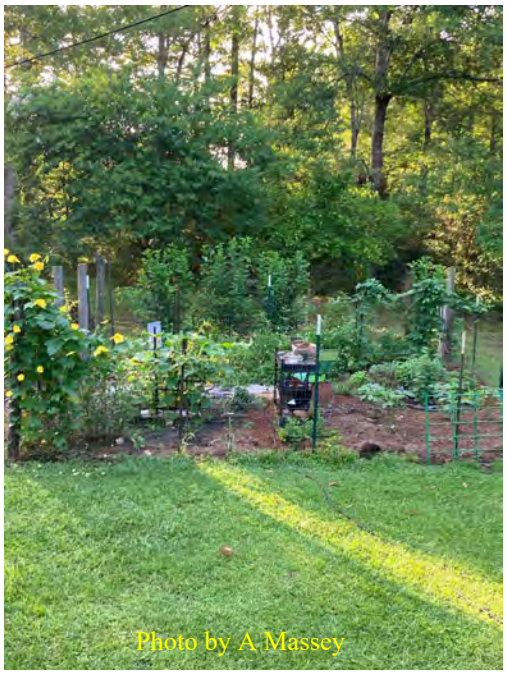

Image from woohome.com

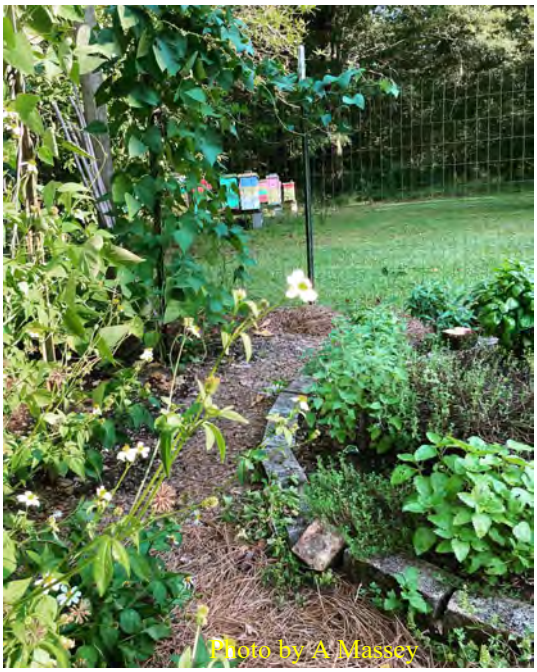
Not a scientific article, but some clever ideas for re-cycling old items into unique garden containers.

https://www.woohome.com/diy-2/top-30-stunning-low-budget-diy-garden-pots-and-containers

STMGA Brag Board

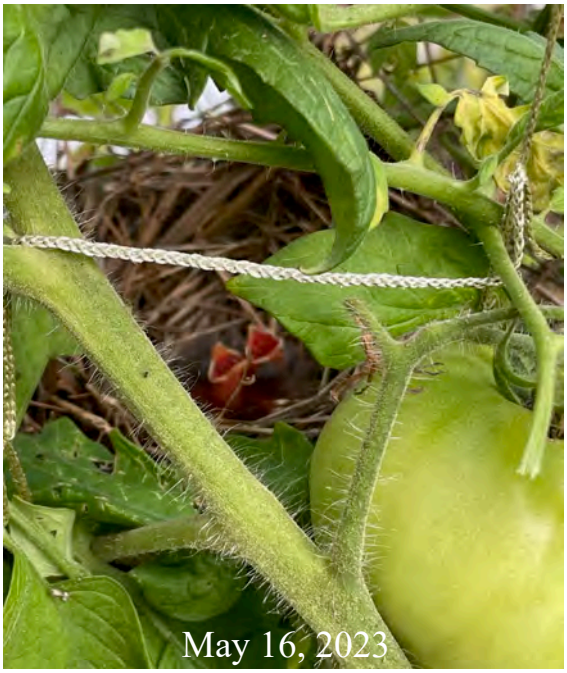
Spring planting in the garden of Andrea Massey, Master Gardener





The yellow flowering vine on the left is a luffa gourd. The vine in the back right is a Snow on the Mountain lima bean variety. I grow a lot of herbs. In the far right photo is lemon balm, thyme, catnip, basil, and bee balm. Also growing cucumbers, okra, and some annuals.

A multi-tasking tomato plant in the garden of Laura Steffee, Master Gardener.



STMGA Brag Board, continnued

First harvest at the farm of Janice Perkins Bullock, Master Gardener … vegetables and zinnias!

Rare Queen Lime Red zinnias

Refrigerator pickles made from our cucumbers

We have two rows of sunflowers

Gold Rush beans grown from seeds I got at a master gardener meeting

Petunias, limelight hydrangeas, and white Sunpatiens

All photos on this page by Janice Perkins Bullock

The Wonderful World Of Herbs

On May 3, 2023, Deborah Nolan presented a lecture to the Vegucators entitled "The Wonderful World Of Herbs." Her full Powerpoint presentation can be found on the computer in the AgCenter classroom.

Definition

Herb

- A plant that does NOT have a woody stem and usually dies back at the end of the growing season.
- They can also be an aromatic plant used in enhancing gardens; can become host plants for butterflies; are used medicinally or as culinary seasonings.

Spice

- Obtained from plant roots, flowers, fruits, seeds, or bark.

Herbs: oregano and sage

Photos by J Blazek

Spice: Turmeric

Common Culinary Herbs

- Parsley
- Sages
- Rosemary
- Thyme
- Basil
- Oregano
- Chives
- Cilantro
- Lemongrass

google image of bergamot

Lesser Known Herbs

- Bergamot
- Dill
- Lavender
- Mints
- Chervil
- Tarragon
- Pineapple
- Sage

The Wonderful World Of Herbs, continued

Whether employed in culinary applications, as an insect repellent, for medicinal purposes, or just as a pretty addition to the garden, herbs have been used and admired since 3000 BCE. An example would be one of my favorites since childhood ... nasturtium. The flowers (which also qualify as a spice) have a wonderful peppery taste, the leaves and seeds are also edible. The unripened seedpods can be pickled and used as a caper.

Potager, or French kitchen gardens, give easy access to culinary herbs that were used frequently. Some of these herbs also had medicinal uses. Lavender was grown for its beauty, as well as its calming fragrance. Thyme was used as an antiseptic, a cough remedy, and as a digestive aid. The term "sage" comes from a Latin word meaning "to heal." Sage leaves were used as a bandage for cuts. Sage tea was given for upset stomach and sore throats. Peppermint relieves nausea and vomiting.

Rosemary is a very versatile plant. It is a beautiful addition to a garden with its striking upright position and lovely lavender flowers. It has a pleasantly pungent fragrance when touched. The leaves are used in cooking. The stems make great skewers for kabobs. Throw a handful of rosemary leaves in warm bath water and soak your aching muscles. If your dark hair needs more luster, shampoo with rosemary essential oil.

Butterflies rely on certain herbs to lay their eggs. Swallowtails love dill and parsley. Sure, their caterpillars eat the leaves, but after they pupate we have beautiful butterflies who pollinate our plants to further our enjoyment. So be sure to plant more of these herbs than you need and share them with our caterpillar friends.

The Wonderful World Of Herbs, continued

In Medieval times, before Walgreens, herbs and spices were used to treat many aliments. Herbal medicines are still popular, but with advanced research, some of these practices have been found to have dangerous adverse reactions. Always check with your health care provider before starting any herbal medication treatment to avoid drug interactions and adverse side effects.

Herbs That Repel Mosquitos

Catnip and other mints
Basil
Sage
Lemon balm
Lemongrass
Citronella
Lavender
Tansy

Herbs That Repel/deter Pests

Artemisia leaves (feverfew)	Moth repellant
Basil leaves	Fly repellant
Tansy leaves	General insect repellant
Mint leaves	Mice, cockroaches, other insects
Rosemary	Fly and mosquito repellant
Lavender	Mouse deterrent

Image of tansy from
outsidepride.com

Image of lemonbalm
from plantgoodseed.com

The Wonderful World Of Herbs, continued

Herbs vs Spices

As previously mentioned, herbs are plants that do not have a woody stems. Spices can be woody or herbaceous, but typically come from roots, flowers, fruits, seeds, or bark. Spices are usually native to tropical climates. They are more potent than herbs and are used in smaller amounts.

Spices are not only used for flavor, they can also act as a preservative, such as saffron, garlic, and coriander. The terms "herb" and "spice" can be complicated. Some people use them interchangeably. Some plants are actually both an herb and a spice:

- coriander/cilantro ... leaves and seeds
- dill ..... leaves and seeds
- fennel ..... leaves and seeds

Here's something to think about ... is a banana a fruit, an herb, or a spice? It is undoubtedly a fruit. Though commercially grown, it is sterile with seeds reduced to tiny specks. The banana plant is called a "tree," but technically it is an herbaceous plant because its trunk does not contain true woody tissue.

There are many more herbs and spices to explore. The ones highlighted here offer garden beauty, act as host plants for pollinators, have delightful aromatic scents, can be pest deterrents, have medicinal properties, and last but not least, have tasty culinary uses.

If we can use garden plants that are "multi-taskers," all the better!

Deborah Nolan
Master Gardener
Vegucator

STMGA Field Trip To Peg Usner's Garden


Photo by E Jaster

On May 19, 2023, members of the St. Tammany Master Gardener Association took a field trip to Peg Usner's private walled garden in Mandeville, Louisiana.


Photo by E Jaster

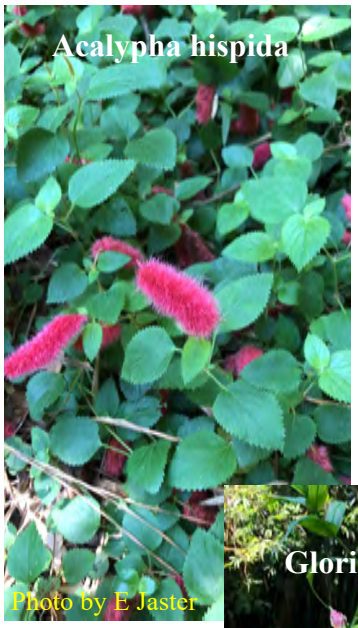

Acalypha hispida

Photo by E Jaster


Gloriosa superba

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STMGA Field Trip To Peg Usner's Garden, continued

Peg Usner is a gardener and local artist. Approximately 25 master gardeners attended. Peg was happy to have us gather some ground cover to help clear one of the paths. The gloriosa was in magnificent bloom for us. Usner uses the natural drainage from creeks to fill ponds and to help with garden irrigation. The walls were created with live bamboo.

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Creating A Container Garden

Before you start your container garden, there are some things to consider:

- Where to place your container garden
- How to construct a platform for containers
- Alternatives to traditional circular containers
- Soil considerations
- Fertilizers
- Irrigation
- Soil pH
- Supports for trellises and freeze covers
- Animal excluders
- Necessary calculations

These topics will all be covered in this article. But before I start, let me give you the backstory on my decision to create a container garden. The soil in Folsom is clay. If I dig a hole and fill it with soil, the bed will drain very slowly, and the chance of root rot is greatly increased. So to have a successful garden in this soil type, I decided to raise my planting beds.

This is my original raised bed before using containers. There was a problem with intrusion of small feeder roots from maple and oak trees that were 20 to 40 feet away. It was necessary to rework the beds every few years to remove the roots. Fortunately, the trees were not close enough to cause too much shade in the garden. The beds were raised atop the native clay soil with a permeable ground cloth to allow irrigation drainage and prevent weed growth.

The garden was healthy and productive for several years until an invasion of the dastardly *Ralstonia solanacearum*. This causes bacterial wilt in tomatoes and potatoes, with a lesser effect on eggplants and peppers. Plant death is the result. Disease recurrence is a given. There is no soil treatment to eliminate the bacteria. The answer to the problem is raised containers if tomatoes and potatoes are the desired crop. If containers are not elevated, the bacteria will reach the vulnerable crops, entering through the drain holes … voice of experience.

Where to place your containers

Sun exposure is a critical consideration. Sun-loving plants, like vegetables and many ornamentals, need a minimum of six hours of full sunlight. Keep in mind that the sun gets lower in the sky to the south during the winter months, so consider the shadow cast by trees, buildings, and fences. During the summer months, the sun will be almost directly overhead.

Sun and water requirements for plants

- Full sun is six or more hours of direct sunlight.
- Part sun plants require between three and six hours of direct sun a day.
- Part shade plants need between three and six hours of direct sun daily, but also need protection from the intense midday sun.
- Full shade less than three hours of sun a day (dappled sunlight).

Proximity to a water supply should be a consideration. In my garden shown here, PVC pipe was buried and connected to an outside faucet with a short leader hose. The PVC section was extended and then connected to the garden with a half-inch supply line. Quarter-inch feeder lines run from the supply line, up the sides and into the containers ending in several emitters.

Decisions to be made regarding size, number, and type of containers.

- do you only want a few containers for a patio.
- do you want to start small with just a few veggies.
- will containers be moved indoors during freezes or remain outside with a cover for freeze protection.

Smaller containers are much easier to move. Clay or decorative pots work well for smaller containers. If you choose smaller or fewer containers, you can use commercial potting soil. It is less labor intensive and more economical than blending your own soil with the components outlined in the soil section below. For a larger garden, you will want larger containers. My fenced garden is 22 feet by 7.5 feet. In that vegetable garden I have:

- four 5-gallon plastic pails (free from Rouse's Bakery) for herbs
- ten 20-gallon Smart Pots™ and plastic ones
- ten 25-gallon black plastic (Lowes)
- three 45-gallon Smart Pots™
- three-small haybale baskets with herbs hanging on the fence

Larger containers will support larger plants, are more productive, and can hold more than one plant. Left, the 25-gallon plastic container in the front has two plants that are larger than the plant in the fabric pot containing only one plant. Use the top of the fence as a height comparison. There are also more eggplants on each of the plants in the larger plastic container than in the smaller container. The volume, usually marked on the container, is needed to determine the amount of soil you will need. Smaller containers for herbs work well and can easily be placed among the five-gallon ones. Hanging baskets or haybale planters can be hooked on the fence above containers with low growing plants to add more variety. The **Down in the weeds with math** section at the end of this article contains the formula and measurements you will need to determine the capacity (in gallons) of any circular container. It is simple math, not complicated.

Alternatives To Traditional Circular Containers

The following section has three examples of successful container gardens from a few of my neighbors, and a fourth, my own container garden.

Jamie McDonald's garden is in Folsom. She has three table-sized containers at waist height to avoid bending, squatting, and kneeling (right and below).

Abundant cucumber foliage is supported by a tunnel trellis that is just visible at the top of the picture below. You can see a little bit of it where the blue sky dips into the foliage.

Two of Jamie's raised tables are placed five feet apart. Her husband, Chris, purchased a section of cattle panel from Tractor Supply and bent it to serve as a trellis canopy between the two tables. This tunnel trellis arches over the walkway and currently supports her cucumbers. The inside height is over six feet from the ground. She said she saw a picture of a similar trellis on the internet. It looked fun and whimsical. She knew she was going to have at least one in her garden.

Creating A Container Garden, continued

Jamie McDonald also has many ground-level cloth containers to increase the number and variety of plants both vegetable and ornamental that she can grow in her garden.

These cloth containers (left) of beans are supported by a plastic fence trellis on two T-posts.

The foreground cloth container (right) has tomatoes while the one in the background of this picture has banana peppers beginning to change color.

Jamie (left) is picking one of her mature salt and pepper cucumbers. They are small and crisp. The cucumber in the foreground is a lemon cucumber. They taste like a normal cucumber but look like lemons.

These are two 2x4-foot planter tables (right) on Judy Wood's porch when she lived in Lacombe. Her husband, Adrian built them with the trellis and the drip irrigation system on a timer. Some smaller containers are next to the banister.

Creating A Container Garden, continued

Lanie Marina's Raised Garden includes an Earth Box™ as another option for plant containers. An Earth Box™ is a plastic box with a reservoir in the bottom for water. A tube is used to fill the bottom. The soil which is above the water section, sits on top of a fine screen. This screen prevents the soil from falling into the water reservoir. There are water overfill outlets are on the sides. You add just the water needed for irrigation. Excess water flows out. These boxes are available on line and at the big box stores. They are available under several different brand names. The boxes are supported by concrete pavers. She uses about half of a large bag of potting mix to fill each of her boxes.

My raised container garden

Filled containers are very heavy, so it is better to choose placement before filling. It is easier to slide them on a platform to reposition for spacing and to allow construction of a trellis where needed. Several cinder blocks can be used for each individual container. I think building a platform gives you more versatility. Boards or posts laid atop cinder blocks provide a level surface for several containers. Once constructed, the platform can last for years.

This photo was taken in early April 2023 just after transplanting my vegetable plants. I built a double twine trellis to support the tomato plants (the lengths of cord in the back corner). Growing tomato stems are woven in and out the cords. All the containers are placed on two-inch thick boards laying atop cinder blocks which are resting on the ground cover. The three-foot wide walkway is covered by pine bark nuggets (individual pieces of the nuggets are larger than those in pine bark mulch).

To begin this project, first level the ground. Place the cinder blocks down and confirm the overall level of all the blocks in a section. Remove the blocks and place the ground cloth down. Replace the blocks and re-confirm they are still level.

Creating A Container Garden, continued

Constructing the platforms

Section A: (see picture below) cut two-inch thick boards to desired length: one 7.5 inches wide and two with a 5.75-inch finished width. The widest board is placed in the center with the narrower boards on either side. Keep enough space between the boards for placing T-posts or PVC for trellises if needed. The overall finished width of the platform is 23 inches. A little space is provided between the platform and the fence. Be sure the lumber is treated for ground contact. The boards will be wet most of the time.

Section B: boards are supported by two cinder blocks. I have a valve that controls the water entering the garden under this section. A small lighter pot is on top of these boards. The small platform provides me easy access to the water valve for adjustments.

Section C: the platform is supported by two 4 X 4-inch boards and one 4 X 16-inch board. The boards are spaced a little farther apart than in the front section. I wanted to compare the life span of the two wooden platforms.

The white PVC trellis (above) is in the center of the garden. I drilled a hole in the floorboard and hammered a 36-inch piece of rebar through the hole and 12 inches into the ground. The white vertical three-quarter inch PVC is threaded over the rebar to the floorboard. The PVC is connected to the center horizontal tubing by a T-connector and an elbow connector on each end. A four-inch mesh netting for the vines is attached to the supports.

Soil considerations

Initially I used the mixture recommended by the Square Foot Garden. I have since developed a mix to achieve a soil with similar characteristics. This soil

- drains quickly but still has components that retain moisture.
- has air space for oxygen and easy root expansion.
- is organic.

This is how I blend the soil for my containers: I mix equal parts of pine bark mulch and sphagnum peat moss. These are mixed in a wheelbarrow with water until thoroughly moistened. Then using a 14 ¾ inch deep container, I mark the inside 11 inches from the bottom. I put a three-inch sand base into the container first. On top the sand, I put eight inches of the wet pine bark/peat moss mixture. This takes me up to the 11-inch mark. Then I mix a one-and-a-half-gallon container of my homemade compost into the mulch/peat moss mixture in the container.

I use pine bark mulch (not nuggets) in place of vermiculite for moisture retention and air space. An equal portion of sphagnum peat moss, along with the mulch, provides both organic content and moisture retention. Unused sphagnum peat moss can be stored in the strong plastic bag in which it comes.

My compost is an aged mix of kitchen scraps, grass clippings, and composted cow manure. Make sure that no herbicides were used on the fields where the cattle grazed. Even residual amounts of herbicides in manure can affect your garden plants … voice of experience from a batch of horse manure I got free of charge.

I do not use as much compost as the Square Foot Garden recommends. This soil mix, plus the fertilizer regimen I use, provides superior results in my garden. Results that are better than when I used the square foot garden recommended blend.

Placing three inches of pump sand in the bottom of the containers ensures a quick draining environment should any roots extend into this area. The fungi that cause root rot prefer very moist environments. Excessive moisture can cause the roots to die due to lack of oxygen. This results in a wilting of the leaves and is similar in appearance to the leaf wilt caused by insufficient water. A moisture meter is beneficial in determining which problem caused the wilt. Once the roots die the only solution is to remove the plant. The roots in my containers seldom grow deeper than eight inches.

A little pump sand mixed into the soil also serves to lighten the soil and increases the ease of root expansion. Additionally, it aids in draining any excess moisture not soaked up by the soil components.

Fertilizers

In my garden I use:

- Miracle Gro™ Plant food with a nitrogen-phosphorous-potassium ratio of 24-8-16, plus micronutrients. It is quick dissolving granules that comes in plastic bags. I add it to the containers every seven to 14 days.
    - Mix five tablespoons per six gallons. Apply at rate of two quarts per plant or container.
- Osmocote Plus™ contains the three macronutrients, nitrogen, phosphorous, and potassium at a ratio of 15-9-12, plus micronutrients and two secondary nutrients. The two secondary nutrients are not in Miracle Gro Plant Food.
    - Mix a capful into the top three inches of soil. The label states it gives a slow release for 6 months.
- Calcium nitrate [Ca(NO3)2] as a side dressing: use ½ teaspoon on two sides staying six to eight inches away from plant.
    - Tomatoes: when 1st cluster sets and again when 3rd cluster sets.
    - Squash: two to three weeks after planting; at bloom and again when 1st fruit sets.
    - Cucumber: when vine begins to run.
    - Eggplant: every two to three weeks when harvest begins.
    - Swiss chard: when plants are six to eight inches tall.
    - Peppers: at first fruit set

Micronutrients are essential to plant growth and are needed in small amounts. Secondary nutrients are needed in moderate amounts while the three macronutrients are needed in large amounts. The two that are absent from Miracle Grow are magnesium and sulfur. Both are secondary nutrients and are important for chlorophyll production and function, along with iron (a micronutrient). Other micronutrients

- enhance flower production and retention.
- contribute to pollen production.
- are important for stem elongation and rigidity to keep the plant upright.
- increases the root resistance to pathogens.

Point being, do not ignore micronutrients and use just with a fertilizer containing the big three: nitrogen (N), phosphorus (P) and potassium (K). Be sure to check the package ingredients for secondary nutrients and micronutrients. And do not forget ... LSU AgCenter offers a soil test kit that checks for theses and includes a pH check.

Soil pH

An optimum pH will ensure the proper intake of soil nutrients important for plant growth. An annual check is recommended. For most herbs and vegetables, the optimum pH is slightly on the acid side, a pH of 6.1 to 7. The uptake of nutrients is optimized in this range. A few plants prefer a slightly alkaline pH of 7.1 – 8. While others, like asparagus, beets, cabbage, carrots, cauliflower, celery, and lettuce, prefer the soil to be a little more acidic. A hand-held pH device is also available at most big box stores, feed and seed stores, and at the Tractor Supply store.

Irrigation

Some containers need to be watered once a day, some twice a day, especially if temperatures are high with minimal rain. Using a hand-held hose requires a lot of time to sufficiently wet the soil in containers. A moisture meter and a two-gallon watering can aid in determining how many gallons are needed to moisten the soil down to an eight-inch level. The meter will also aid in hand watering any in-ground garden to insure an adequate depth of water penetration.

Since 2010 I have used an irrigation system from DripWorks that has worked well in my gardens in Folsom. Several types of delivery systems and emitters with different flow rates are available. The website, Dripworks.com, has a resource page with how-to videos, a planning guide, FAQs, and more. A catalog is a must when designing your system. Other systems and components are available in the big box stores.

I used the half-inch Mainline Tubing in my gardens. This tubing has a recommended flow rate of 240 gallons per hour. It would take a while to add up all the emitters to determine the flow rate for your design. Turn the system on before all the emitters are attached. This will provide an idea of the normal flow rate. Once the system is completed with all emitters, turn it on and check the emitters to determine if the flow rate is adequate for each container. There are several designs and delivery rates for emitters. These can vary with water pressure. I placed a 30 PSI regulator after my timer. The timer runs on two AA batteries which lasts a little over one year in my garden.

The flow rate of the timers in the fenced garden varies from 0.42 to over 20 gallons per hour. A vary-flow valve on each container's emitter allows the pressure to be reduced or increased incrementally with a twist of the knob. So, I can easily adjust the water flow rate to the particular needs of each plant. Tomato, squash, and eggplants are high water users. I use two 2-gallon emitters on their containers.

To determine how much water each container needs check after filling with soil and before the plants are in place. Use a moisture meter and a two-gallon watering can. Pour two-full cans of water per container early in the day. Check the moisture meter at noon, in the evening, and again the next morning. I use the Dr. Meter brand because the numbers are color coded and large enough to easily see. In the red zone 1, 2 and 3 the plants need water. In the blue zone 4, 5, 6 and 7 the soil is slightly moist. In the blue zone 8, 9 and 10 the soil is saturated, no more water needed.

Freeze covers for winter

I drove three-foot sections of rebar about 12 inches into the ground on either side of the platform. Then I threaded sections of rigid-walled ¾ inch PVC over the rebar. When a freeze is expected, I drape covers, suspended by the PVC pipes, over the plants. The PVC supports are tall enough and spaced far enough apart to prevent covers from sagging and touching the plants. Cloth covers are better than plastic. Once the sun comes up, plastic covers can overheat the plants if left on too long. Sheets are used to cover the cages in the garden in the foreground.

Animal excluders

Deer and rabbits are abundant in Folsom. They love to graze on any unprotected salad bar. The deer also find my bed of Fire Spike flowers irresistible. Armadillos are numerous, but they do not eat vegetables or flowers. They just uproot them in their search for grubs and worms. Five-foot high sections of horse panel fencing supported by T-posts provide a perfect barrier for excluding deer, rabbits, and armadillos. The panels are in sections five feet high by 16 feet long and can be bought at feed and seed stores. The horse panels are attached to the T-posts by thick electrical ties. The thickest and strongest tie comes in 18-inch lengths. I cut off the tails after tightening.

Creating A Container Garden, continued

A large planting of corn can present a challenge. The Gilberts live in Chanel Farms and were upset because the deer were getting more corn than they were. They installed an Australian Deer Fence (I could find no reference for this kind of fence). They made it made with T-posts and strips of caution tape as seen in the photo (left). They said it worked. If deer look over the fence and see a clear area without caution tape, they will jump the fence. By running a piece of caution tape back and forth over the open area, the deer see it as an obstacle and do not enter the garden.

Jerry Ballanco had a large garden surrounded by a metal chain link fence. He ran a section of electric wire around the top charged by solar power. This solved his problem of the racoons getting his watermelons and cantaloupe when the fruit ripened. For unprotected smaller and lower growing crops, like lettuce, a small cage can be constructed using a four-foot section of 2 X 4-inch welded wire fence. Open topped cage (right) offers protection from rabbits and armadillos. But no protection from deer.

Completely enclosed cage for this ornamental plant (left) provides protection from deer, rabbits, and armadillos.

A cute little bunny (right) contemplates how to defeat a cage that will be placed over a delicious lettuce bed.

Down in the weeds with math

To calculate the volume of your circular containers if they are not already marked, you only need to measure the inside width and the inside height of the container. Using a calculator, follow these steps and do not clear the calculations between the four steps. In my example I used the measurements of the pictured black plastic container: an inside diameter of 22.50 inches (radius = 11.25 inches) and an inside depth of 14.75 inches.

Things to remember:

- a gallon is 231 cubic inches
- radius is ½ of the diameter
- π is the symbol for pi, a value of 3.14
- the area of a circle = πr^2

Step 1. Square the radius (multiply it by itself): 11.25 X 11.25 = 126.56. **Do not** clear your calculator.

Step 2. Tap the multiply key X on your calculator and type in "3.14" (the number for π) then the equal symbol = to get 397.406 square inches. **Do not** clear.

Step 3. Tap the multiply key X and enter the inside depth of 14.75. Tap equal = to arrive at 5861.7421 cubic inches for the container volume. **Do not** clear your calculator.

Step 4. Tap the divide key ÷ and enter the cubic inches of a gallon which is $231in^3$. Tap the equal = for the size of your container in gallons = 25.375. Rounded it to 25 gallons.

You just did the math to determine the volume in gallons of your container in four easy steps! Now you are ready to buy soil.

The 25-gallon large black plastic pots are available at Lowe's in the pond section. Three-quarter inch drain holes will need to be drilled in the bottom. Drill four around the edges and a couple near the center. Fabric Smart Pots™ are available in several sizes, smaller ones in the photo are 20 gallons, the larger are 45 gallons. They do not need drain holes. The porous fabric allows excess water to drain out. Many manufacturers make different sized fabric pots.

Creating A Container Garden, continued

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Photos in this article by A Scott

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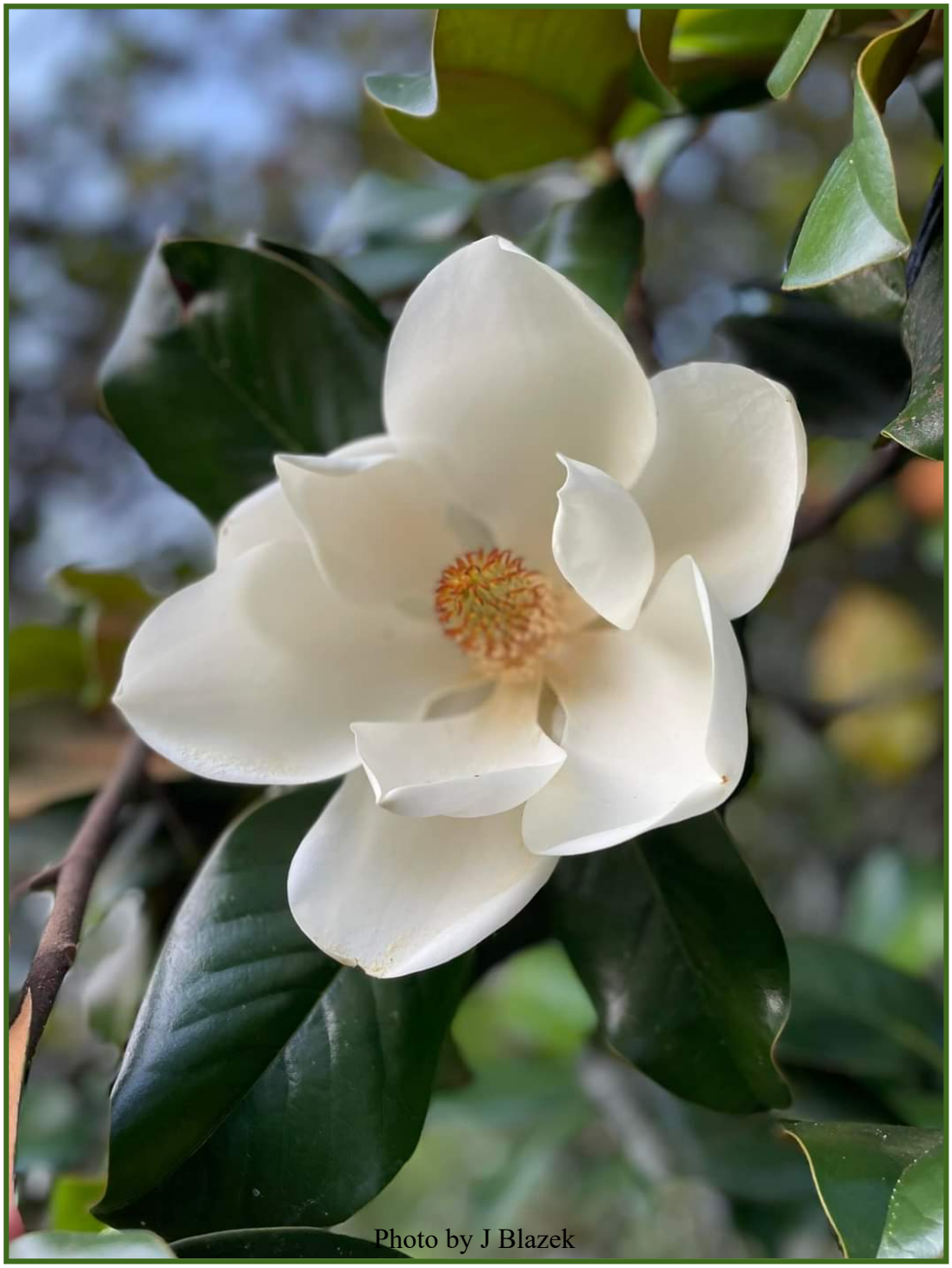

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