

THE OPTIMISTIC GARDENER



Local Horticulture Newsletter
Chautauqua & Cattaraugus Counties

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"Dear Master Gardener"

Q: The weather is warm, can I uncover my flowerbeds?

A: Even though there may be several warmer days, gardens should remain covered until temperatures are consistently 50 degrees or more. Many pollinators are in the leaf litter and could be destroyed if it is removed too early.

Do you have a question for our Master Gardeners? Please submit your question here:

chautauquamg@cornell.edu
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THE OPTIMISTIC GARDENER

Sharon Rinehart
Chautauqua County Master Gardener Volunteer

Welcome gardeners to the first issue of our second year of TOG. It is hard to believe it has been a year since we started this endeavor. We hope you have found interesting and helpful information in our articles.

For most of us, this has been an unusual winter. We have had very little snow and unseasonably warm weather. I am sure our gardens are confused. My daffodils think it is time to emerge so it should prove to be an interesting spring.

Yes - we are still optimistic gardeners as we start our seeds indoors and prepare for an exciting new growing season. I am trying winter sowing as discussed in an article in this issue. When the next issue comes out in April, all our thoughts will be on planting and working the gardens. I'm excited about it and hope you are too.



Featured Business



Royal Fern Nursery LLC started operations as a small home-based nursery in 2019. A woman-owned, all-native nursery, we specialize in providing species of plants that are naturally found in the region, and have been growing here long before European colonization of North America. We strive to provide as locally sourced seed and plant material as possible, as that aids in supporting the local genetic resources found in local populations. In 2023 the Nursery expanded, purchasing an adjacent parcel with more space and a large barn. We now have a new retail location at 8888 Glasgow Road, Fredonia NY that will be open to the public in June.

Royal Fern Nursery LLC also provides consulting services in various capacities to a wide range of clients - private landowners, community associations, non-profits, municipalities and academic institutions. We are experienced in biological surveys, ecological restoration, education/training, climate vulnerability analysis and mitigation planning, mapping-based services (floodplain analysis, conservation prioritization, habitat assessment) and much more.

Want to learn more? Throughout the year we offer presentations about the power of native plants for various organizations around the Southern Tier. Royal Fern can create a presentation, custom workshop, or training program based on your needs. The more you know, the more you will want to grow! One of the biggest impacts native plants can have on our local ecosystems is when they are used in restoration projects. The plants we supply to these projects are grown from local seeds. This is vital to help increase the success rate of what is usually a large scale planting in disturbed/difficult areas"

8853 Glosgow Rd., Fredonia, NY
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Start your Best Garden with Winter Sowing

Shannon Rinow

Master Gardener Coordinator



Winter in Western New York is a great time to begin garden planning for the season ahead. If you are a gardener, I am sure you can relate to the excitement when the seed catalogs begin to arrive. Although February is a little early to start seeds indoors (think last frost and count backwards!), winter sowing OUTSIDE is a great option!

Those of us in cold climates don't usually think of January and February as times to plant seeds outside; however, for many perennials and hardy annuals, this is a great time to start! Many plants like a period of cold and wet weather to germinate. You will want to stick with cool-season crops – like broccoli, cauliflower and cabbage. Leafy greens – like lettuce, kale and bok choy – are also zone “hardy” annual options. Herbs like sage, oregano, dill, and mint are good winter sowing candidates too. Any plant that is “hardy” in our growing zone is a great candidate for winter sowing. If you are unsure of your growing zone visit here to find out: <https://planthardiness.ars.usda.gov/>. Wait until late winter or early spring to plant tender annuals.

Winter sowing provides many benefits; low-cost plants and low or no cost materials using household items you have on hand. To get started all you need are the following items:

- 1-gallon jugs (milk or water jugs work great)
- Seeds (choose “hardy” native, disease-resistant varieties for best results)
- Seed starting soil (shop at your local nursery for high quality soil)
- Tape
- Knife
- Permanent marker

You do not need grow lights or indoor space because you will use the natural sunlight outside. The 1-gallon jugs act as Mini-greenhouses.

Step 1: Collect and wash your 1-gallon jugs. Remove the caps, these will not be used to allow for snow and rainfall to moisten the seeds. Do not add water to the jugs!

Step 2: Add drainage holes to the bottom of your 1-gallon jugs. I use a knife, but you will want to take care because the jugs are flimsy. I add about 8-10 holes to the bottom.

Step 3: Cut the 1-gallon jug almost into a full circle. I start about half-way up the jug and cut from the handle all the way to the other side. Leave about 3 inches on the back part of the handle so you have a flap for opening and closing the jug.

Step 4: Add the seed starting soil. I fill this just below the cut I made.

Step 5: Plant your seeds. Read the seed packet to see how deep you should plant them. Some say surface sow, others may need ¼ inch or more. Do not over sow your seeds. Remember in the spring you will need to separate and transplant them. You will want healthy plants. Read the seed packet for spacing.

Step 6: Close the 1-gallon jug and tape all the way around. I used blue painters' tape because I had it in hand plus I like to write the plant names on it.

Step 7: Label! You will want to label each jug in multiple places. I also keep written records in my garden planner so I can remember what I planted in case the writing washes off. I have had this happen in the past.

Let nature do her thing! You will want to check them in the Spring to ensure the soil is moist. Because they have been outside in the elements, they will be well adapted to the outside temperature. When transplanting, gently separate roots and plant them in an area based on their growing requirements. Do a thorough site assessment well before you transplant. You will want to consider the amount of sunlight, drainage and soil type.

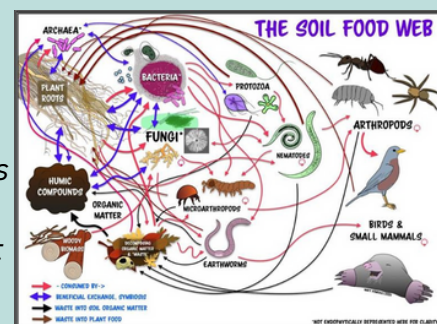
Reach out to our CCE-Master Gardeners for help with your gardening questions! Happy Gardening!

Dear Reader,

In December's issue of *The Optimistic Gardener*, the article on the **Soil Food Web** introduced you to members of the soil sociobiome. This February issue continues the introductions of the microbes and other organisms that make up this vital ecosystem. It goes on to identify the causes and actions that have and continue to degrade our agricultural land here in the United States and across the globe. In the third installment, scheduled for April, a look will be taken on actions gardeners can take to build the very best soil to support the soil food web and grow the healthiest and most nutritious crops.

See you in the garden.

Dinah Hovey, Chautauqua County Master Gardener Volunteer, Class of 2020



Fungi Also Like to Stay at Home. They get cozy inside and outside the roots of plants establishing mutually beneficial aka symbiotic relationships for sharing nutrients and water. These symbiotic living arrangements marry the roots of plants with fungal partners and are called "mycorrhizae" which literally means "root-fungus" (myco for fungus and rhiza for root.) There are two types of mycorrhizal fungi. Endomycorrhizal fungi can penetrate root cells and provide for nutrient exchange by means of tree-like structures called arbuscules and intercellular hyphae which penetrate between plant cells.

They colonize the roots of most vegetables, grasses, flowers, shrubs, fruit and ornamental trees. The endomycorrhizal fungi are also known as arbuscular fungi. These arbuscular mycorrhizal fungi are often referred to in the literature as AM or AMF. However, the following plant families are non-mycorrhizal; they do not form mycorrhizal associations with fungi. These include Brassicaceae (broccoli, cauliflower, brussel sprouts, cabbage, kale, collard, canola, mustard, arugula, mizuna and other Asian greens, bok choy-pak choi is an alternative spelling, turnip, rutabaga, radish, etc.); Amaranthaceae (amaranth, quinoa, beets, chard, spinach, pigweed, lamb's quarters); Polygonaceae (buckwheat, rhubarb, sorrel, dock); Montiaceae (claytonia); Portulacaceae (purslane); and Scrophulariaceae (mullein, figwort). Also non-mycorrhizal are horsetail, reed, rush, and sedge. Other fungi are Ectomycorrhizal and they colonize woody plants, mainly conifers and some deciduous trees such as oak, and beech. They have extracellular hyphae which wrap around the outside of roots forming a protective interwoven covering or mantle. Ectomycorrhizal fungi penetrate host cortex cells and form a nutrient exchange structure called a Hartig Net. We know the fruiting bodies of these fungi as mushrooms. Ectomycorrhizal fungi are often referred to as EMF, ECM, EcM. Protozoa and Nematodes Remove Garbage. And Deliver Nitrogen. Protozoa and nematodes are the big guys and they are hungry. Protozoa and nematodes freely dine on the smaller microbes and each other. Those cannibals! They eat their prey dead and alive. Their excrement is full of extra nitrogen, which is recycled back into the soil where it can be used by plants and microbes to build those important organic compounds. Remember chlorophyll and DNA, etc. In healthy soil, plants get most of their nitrogen from the decomposed bodies of soil microbes.

Nematodes are quite a bit bigger than protozoa but most are hard to see without a microscope. They are blind, non-segmented (round) worms. They mineralize plant nutrients by eating other microbes. They have specialized mouth parts depending on their prey. Some are herbivores feeding on plant roots. Perhaps you have observed plants with root knots caused by parasitic nematodes. Others feed on bacteria (bacteriovores) or fungi (fungivores). They keep these populations in check. Some are omnivores; they eat each other as well as protozoa, algae and larger members of the soil food web such as slugs, grubs, weevils, etc. Beneficial nematodes may be purchased to use as an effective biocontrol for slugs. Most are beneficial with few predatory and plant-eating ones. Nematodes can locate prey via thermal and chemical means. They can sense minute variations in soil temperatures and they know what soil temperatures house their prey. They also identify the chemical signature of their prey. Too cool for school!

Continue on next page

Useful tools if you are blind. Due to their larger size, they require a more porous soil to be able to navigate. In compacted soils without nematodes, there will be less nitrogen available for plants. Nematodes are also part of the taxi brigade which spread microbes to new locations. (Source: Teaming with Microbes: The Organic Gardener's Guide to the Soil Food Web by Jeff Lowenfels and Wayne Lewis)

Redundancy. The work of microbes overlaps. Different microbe species perform many of the same crucial functions in the soil. As prey and predator, they mineralize nutrients. and cycle carbon and nitrogen. Bacteria and fungi produce important metabolites. Protozoa and nematodes keep bacterial populations in-check. Arthropods Are Important Too! Arthropods are organisms with feet, segmented bodies, and exoskeletons made of chitin. Some are microscopic like the soil mites. Others like the Alaskan king crab are huge. Examples of arthropods making up the soil food web can include mites, springtails (collembolans), earwigs, centipedes and millipedes, pill bugs, daddy longlegs, spiders, ants, termites, beetles, crickets. In addition to being prey and predator for other organisms, many soil arthropods are "shredders". As they chew up organic matter they create greater surface area to be attacked by bacteria and fungi. As OM is shredded and moved, the arthropods also taxi-around soil microbes. And if there is not enough dead organic matter to feed upon, arthropods will attack living roots. (Source: Teaming With Microbes: The Organic Gardener's Guide to the Soil Food Web by Jeff Lowenfells and Wayne Lewis)

Earthworms and Vermicastings. Earthworms are highly visible, important members of the soil food web. " A noticeable worm population is a clear sign of a healthy food web community." They can register light and dark, sense vibrations, and have chemical receptors on their bodies to enable taste. They are the master shredders, real eating machines!. As they consume organic matter, they also consume the bacteria, fungi, protozoa, and nematodes found therein. Earthworm poop or worm castings are high in nutrients containing 5 x the nitrogen, 7 x the phosphorus, 10 x the potassium, 3 x the magnesium, and 1.5 x the calcium than soil that has not traveled through an earthworm's digestive tract. The liquid calcium carbonate that is added during the digestive process helps provide stability for soil aggregates." Worms can deposit a staggering 10 to 15 tons of castings per acre on the surface annually." Earthworms move in the soil both vertically and horizontally and the resulting bioturbation and tunnel formation improve soil aeration, water infiltration, water-holding capacity and create pathways for roots to easily penetrate. Bioturbation also moves nutrients and microbes to new locations. (Source: Teaming With Microbes: The Organic Gardener's Guide to the Soil Food Web by Jeff Lowenfells and Wayne Lewis)

More on Earthworms. While there are thousands of species of earthworms, they may be categorized into 3 groups. The epigeic group are the surface dwellers, not commonly found in cropland but rather found mostly in forests where they feed in the surface litter/duff layer, the O horizon layer of the soil. Here they eat the leaf litter, decaying organic matter, small microbes and dung. Red wigglers used for composting (vermicomposting) belong to this group. The endogeic group are soil dwelling and include the common garden earthworm. This group feeds on organic matter and microbes in the topsoil where they make horizontal branching burrows and deposit their nutrient-rich excrement as worm castings within their burrows. The subsoil or deep burrowing anecic group lives in permanent and deep (sometimes 5-6 feet), vertical burrows and come to the surface to feed on crop residues. They can harvest large pieces of debris and even whole leaves can be pulled into their burrows. The burrows are capped with their worm castings or middens which are made of crop residue and excrement. The nightcrawler is a member of this group. (Source: extension.psu.edu/earthworms)

According to Gary Zimmer, agricultural consultant and co-partner in Midwestern Bio Ag, Bio Ag Learning Center, and Otter Creek Organic Farm, one cubic foot of very healthy soil will house 25 earthworms. Less than 5 indicates a very poor soil.

Nutrient Recycling: Immobilization and Mineralization. In natural systems there is no waste, just opportunity. So let's look at the recycling processes; the capture and release processes that we call immobilization and mineralization or biomineralization. One of the vital roles of the soil food web is to cycle nutrients. Nutrients that make up the cells/tissues/organelles/bodies of organisms are said to be immobilized. Nutrients that are held onto humus particles and clay by way of electrical charges are also immobilized. This is the opposite of being mineralized which is the process or state of being released and thus plant-available. In the bug-eat-bug example above, nitrogen is locked up or immobilized in the bodies of bacteria. Protozoa and nematodes then eat the bacteria and mineralize (release/make available) the nitrogen that is in excess of what they need. This excess nitrogen is excreted as mineralized nitrogen as part of the waste material. The nitrogen in the waste is now available to be immobilized anew by other organisms. A pretty neat loop-de-loop.

What Do Plants Eat? Nitrogen and Other Nutrients. Plants acquire food in 2 basic ways. First, they feed themselves by producing sugar through the process of photosynthesis. Second, they acquire microbe-mediated nutrients. There are approximately 20 elements, and the number keeps expanding, that have been identified as essential nutrients for plants to grow. After carbon, oxygen, and hydrogen, nitrogen is the most common element found in plant tissues. It is needed for vigorous early growth of roots, shoots, and leaves. It is essential to the formation of chlorophyll and thus photosynthesis. It is essential to the production of nucleic acids found in RNA and DNA. It is essential in creating amino acids which then are used to form proteins found in plant structures, enzymes, hormones, signaling chemicals, etc. Nitrogen is considered one of the macronutrients along with phosphorus, and potassium, and others. These three are the nutrients that are commonly designated as N-P-K on synthetic fertilizer products. The representation of potassium, commonly termed potash, and represented by the letter K, refers to its Latin name kalium. Macronutrients are those plant foods needed in the greatest quantity. There are also essential nutrients needed in lesser or trace amounts. These are called micronutrients, sometimes trace nutrients. And there are also other nutrient minerals in soil for whom a function has not yet been determined. Here is an imperfect mnemonic device to help you remember the 9 macronutrients and some of the micronutrients: C.HOPKiNS CaFe is ManaGed By My COUZiNs Mo and CLaude. (Source: [spellogram.com > index.php > 180 trick-to-remember-essential-nutrients](http://spellogram.com/index.php/180-trick-to-remember-essential-nutrients)) Gardeners who acquire knowledge of the various plant nutrients, how they contribute to plant growth, and how they cycle through the soil food web gain essential tools to help create optimum growing conditions for their crops. Now back to the nitrogen cycle which is the story of how microbes mediate this essential nutrient to produce nitrogen in a plant-available form.

What is the Nitrogen Cycle? "The nitrogen cycle is a biogeochemical process through which nitrogen is converted into many forms, consecutively passing from the atmosphere to the soil to organism and back into the atmosphere. The nitrogen cycle involves several processes. These include Nitrogen-Fixation, Nitrification, Assimilation, Ammonification, Denitrification." Nitrogen needs to be combined with oxygen (lightning) or hydrogen (bacteria) to enter the nitrogen cycle. Once again, bacteria are major players. The majority of the nitrogen cycle in the soil is accomplished by bacteria that fix nitrogen gas, that is present in the pore spaces of the soil, into ammonia; turn ammonia into nitrates which are the plant-available form of nitrogen; cycle/recycle organic nitrogen compounds in the tissues and bodies of the plants and organisms found in the soil food web; and return nitrogen to the atmosphere. These processes repeat continuously and maintain the balance of nitrogen in the atmosphere and as a nutrient in ecosystems. Other nutrients including phosphorus and potassium, and others also move through the soil food web via their distinct nutrient cycles. Note: In addition to the biological nitrogen-fixation that occurs in the soil, there is also an aquatic process and cycle carried out by marine bacteria, an industrial nitrogen fixation process used to make nitrate fertilizer (Haber-Bosch) and an atmospheric nitrogen fixation process carried out by lightning that uses oxygen. (Source: [The Nitrogen Cycle Explained - byjus.com/biolpgy/nitrogen-cycle](http://TheNitrogenCycleExplained.com))

Continue in next issue

SAGE ADVICE

Sara Slagle
Master Gardener Volunteer Apprentice

LEMON BALM

Melissa officinalis, Lamiaceae

This fragrant favorite in the garden is native to the Mediterranean but has since become one of the more popular perennials to grow for a multitude of reasons. It's versatile as a medicinal herb but will also attract the pollinators. Melissa is Greek for 'honeybee' and has been a long-standing tradition of symbolism in many ancient cultures.

This is another easy-to-grow additive to your garden, that won't disappoint. It's commonly known for its digestive properties, but can also assist with ailments as a nervine, antiviral, and diaphoretic. Like most members of the mint family, it's relatively gentle and safe for all ages. It's most commonly used as a tea or tincture, but also can be prepared into a variety of recipes – simply throw some in a salad, delicious! Lemon Balm is high in potassium, magnesium, and calcium.

This classic herb for nervous conditions is where it gains its popularity as a gentle sedative. Paired with other herbs, such as Chamomile, Annise Hyssop, Mint, and Skullcap will make the most relaxing tea blends. Its flavor is that of a bright and sweet lemony aroma making it the perfect herb to make any concoction even more tasty, without overpowering.

Growing this herb is a cinch. It grows very similarly to common mint and is known as an aggressive self-sower, so be weary planting in the ground. Cut it back regularly through out the season to promote bushier growth and be sure to pinch flowering buds to keep it from going bitter. It prefers rich soils, but will also survive in dry, sandy soils. As it's native to the Mediterranean, so be sure not to overwater. It will thrive in a sunny spot but will also grow well in partial shade. If you're looking to attract native bees and other pollinators to your garden, this one is sure to do the trick – they can hardly resist the citrusy aroma.

Lemon Balm is one of the easiest medicinals to grow but is more successful when propagated through root division. While it can be grown from seed, it tends to be a bit trickier with the cold stratification process. Light and soil temperature conditions should be "just right" to achieve successful germination. Root divisions can be made in the fall or early spring for the best results.

As always, stay calm and keep growing!

Parts used: leaves and flowering tops

Energetics: cooling and slightly drying

Taste: slightly sour with a citrus aroma

Medicinal Properties: nervine, carminative, diaphoretic, sedative, antiviral

How to Grow: Zone 3-10, full sun to light shade, well-drained soil, May – October

Sources: Chestnut School of Herbal Medicine; Botany in a Day by Thomas J. Elpel



Image Source: Botany in a Day, Thomas J. Elpel



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Sara Slagle, Master Gardener Volunteer Apprentice

PART II

Now that you have all of the glorious lemon balm, what can you do with it? The answer is... pretty much anything! Tea, oils, salves — you name it!

TEA

There are endless combinations to use this herb, but here are my favorites. Feel free to use either fresh or dried herbs; steep 5 minutes and enjoy hot or iced.

Digestive Blend: equal parts Lemon Balm, Mint, Chamomile, Fennel seed Sleep Blend: equal parts Lemon Balm, Chamomile, Lavender; ¼ part Rose petal

Spring Refresh Blend: equal parts Lemon Balm, Mint, Calendula; add fresh lemon, orange, or cucumber

LEMON BALM PESTO

Yield: about 1 cup

1.5 oz (by weight, 42g) – about 3 cups fresh lemon balm (leaves and/or stems) 1 /2 cups of walnuts or pine nuts

2 – 3 cloves of fresh garlic

1 /2 cup of Extra Virgin Olive Oil

1 /2 cup parmesan or pecorino-romano cheese

3 tbs. fresh lemon juice

Salt to taste

Combine all ingredients into a blender or food processor; blend until smooth; use immediately for fresh results. Will store in fridge up to 2 weeks; may also freeze.

LEMON BALM INFUSED OIL

First, let's start by making a lemon balm infused oil. This will take 4-6 weeks (but it's worth the wait!)

Place 1 /2 cup of dried lemon balm leaves into a clean and sterile jar. Cover with a carrier oil; the best options are: grapeseed oil, almond oil, sunflower oil — all can be found at your local grocery store or online. Let sit in a dark place for 4 to 6 weeks and give the jar a swirl every day or so. Afterwards, strain oil into a clean vessel for the next step. You can also add other herbs into your infused oil, such as rose hips, rose petals, lavender, or calendula — so many choices and are all great for the skin.

LEMON BALM SALVE

Yield: 5 - 1 oz. tins or a 4 oz. mason jar

4 oz. lemon balm infused oil

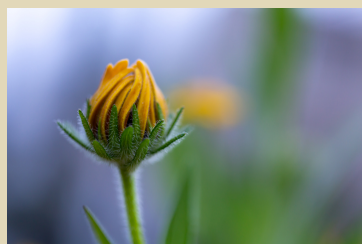
1 oz. beeswax pellets (from your local farmstand or purveyor, if possible)

(1) 4 oz. mason jar or (5) 1 oz. screw-top metal tins (can be found online)

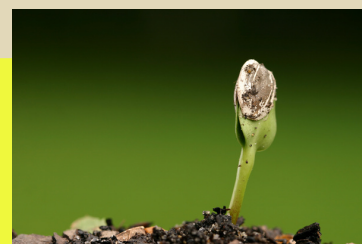
In a double boiler, heat oil and beeswax on low heat until completely melted. Remove from heat and pour into clean and sterile vessels. Let set for about 2 hours — do not refrigerate. (Refrigeration can cause the oil to go rancid). If the balm isn't the right consistency for you, feel free to reheat on low and add more bee's wax for a firmer salve. It should have a smooth, buttery consistency.

This balm will shelf-stable for about one year — if it makes it that long! You can apply it to dry, irritated skin or mild rashes. This is also makes a great lip balm and can alleviate those pesky cold sores.

The information provided is not intended or implied to be a substitute for professional medical advice, diagnosis, or treatment. Always work with your physician or qualified healthcare provider before adjusting medications or adding supplements. As with other medicines, the plants that are covered can have synergistic effects when mixed with prescription medications, over-the-counter medications, or other plants. It is also important to note that the regulations that govern some medicinal plants can vary widely from location to location.



Garden Quote



"Every gardener knows that under the cloak of winter lies a miracle...a seed waiting to sprout, a bulb opening to the light, a bud straining to unfurl. And the anticipation nurtures our dream."

Barbara Winkler

Local Master Gardener Volunteers

Steve Rees

Steve Rees has been an avid gardener in Dunkirk for over 30 years and a Master Gardener since he and his wife, Mary completed the Cornell Cooperation Extension Master Gardener Program in November 2013. As a gardener, he is particularly interested in soil composition and composting. He retired from the Department of Theatre and Dance at the State University of New York-Fredonia in 2010 after serving variously as the Technical Director, Lighting Designer, and department Chair of the over 28 years. He also was an Entertainment Technology Certification Program Certified Rigger for Theatre until retirement. He served 12 years, most often as secretary, on the Board of Directors for the 1891 Fredonia Opera House. After earning a BS in Theatre from University of Wisconsin-Stevens Point, he attained a Master of Fine Arts in Design and Technical Production from the University of Memphis. He previously served as Technical Director and Lighting Designer at the University of Georgia before coming to Dunkirk in 1982. He has been actively involved with Revitalize Dunkirk, Inc since the first meeting of the group in 2013, serving in various roles as a member of the Board of Directors. He currently serves as the Chair of the Point Gratiot Reforestation Committee, a Revitalize Dunkirk project. Additionally, he has been involved with the Academy Heights Neighborhood Association, the Dunkirk Zombie Property Residential Survey, various city street and beach cleanups, and formerly served on the City of Dunkirk Property Maintenance Board and the Brooks Hospital Reuse Committee. Mary and he were awarded the Northern Chautauqua Community Foundation's George Weaver Footprints Award for their community service in 2022.

Photo: MG Banquet where volunteers with “over 1000” volunteer hours received recognition.
Steve Rees is pictured in the back row.



Garden Joke (but true)

You might be a gardener when you can't resist the urge to pull weeds in public parks and other peoples gardens



Compost Structures

by

Steve Rees

Cornell Cooperative Extension, Chautauqua County Master Gardener Volunteer



This article started off being something else entirely until it occurred to me that there are dozens if not thousands of composting articles, tips, hints, and videos to be found on the internet, in reputable magazines, or your public library. Many of those resources are better informed and researched as well as being much more scientific in nature. Really now. Do we need one more in the genre? I think not.

I choose instead to address a segment of the compost process that's often overlooked or given short shrift in discussions. Perhaps because I'm mechanically inclined by nature and I enjoy problem-solving, I felt that I could address the various models of compost bins/piles/enclosures in some detail. The idea of creating a place and a method for composting has long intrigued me as people sought advice for their individual composting needs. As Master Gardeners, we often think of selecting the right plant for the right place. The same holds true for a composting method; finding the right place and proper enclosure is an important initial step in the composting process. I would propose that selecting that place and the appropriate enclosure can go far toward achieving a good outcome in YOUR situation.

I'll address six "systems" and hope that you can find one most suitable for your needs. These systems can be incredibly simple or can become as complex as time, energy, and finances will allow. Keep in mind that irrespective of method, the best results are obtained through patience and commitment. Also, in any system, the basic tenets of composting will always apply: only organic matter, no fats or bones, no diseased plant matter, proper ratio of carbon and nitrogen-bearing materials, good aeration, and proper moisture level among other considerations are of utmost importance. Finished compost is not attained overnight and your patience will be rewarded if you give the process time. Likewise, being committed to your process and diligently aiding the aerobic decomposition in your pile, bin, or other device on a regular basis will result in a final organic product that will be of great benefit in your garden or flower beds.

In the world of composting, nothing could seem easier than simply piling up yard, garden, and kitchen waste and just letting nature take its course over time. While indeed very simple in concept, there are a few cautions to consider. Is your location urban, suburban, or rural? How large is the space you have available? How near are your neighbors and how visible will your operation be? Are there any local zoning or HOA prohibitions? How rapidly do you want to have compost available? You could likely think of other concerns, but you get the idea. The right process in the right place!

The Compost Pile: By its very nature, a pile has no defined volume or shape but some effort should be made to confine it to a reasonable size. As such, a pile is probably the simplest and certainly the least expensive method. Just keep piling on the compostables and over time – often quite a bit of time – you’ll be rewarded with rich compost at the bottom of the pile. If you take the effort to occasionally turn and aerate the pile, decomposition can occur more rapidly. It is possible to let a pile accumulate to a significant height and volume for many months, even years before separating the finished material from incompletely digested matter. However, it is likely to be more efficient to turn the piles and screen out the finished compost at least once or perhaps twice a year. I’ll discuss screens a bit later. Sorting the materials will give you usable compost as well as aerating undigested matter in the process of creating a new pile. Because decomposition relies on heating as well as moisture, air, and microbial and insect activity to function efficiently, this periodic turning is very beneficial. Patience and diligence are definitely key factors in maintaining such a pile.

Trenching: Often one wishes to compost but is prevented for one reason or another or simply does not want the composting activity to be visible. In trenching, one can define a linear area in a bed or garden that they expect to lie fallow for some time without disruption. Depending on the volume of organic matter needing to be treated, a slit trench about 6” – 12” wide and approximately 12” deep is created with the spoil mounded along the length of the trench. For a less disruptive trench, a narrow 4” drain spade or a 5” transplant spade is ideal for this purpose. As organic waste is collected, it is placed in a layer just a couple of inches thick in the trench and then covered with soil. Continue adding raw material and covering until the length of the trench is completely filled, then move to another area and start again. The covered matter should not be disturbed by vermin, but if such is the case, placing a layer of screening or fencing will deter the critters. In practice, you won’t see your compost again unless you choose to plant in that area. Unlike other methods proposed here, this is an anaerobic process because air is excluded by burying the organic matter. Allow at least several months for decomposition to take place.

Compost Bins: I differentiate between bins and enclosures for purposes of this article. Because I consider enclosures to be more permanent in nature, I’ll discuss them later. I generally think of bins as being simple in design, semi-permanent or temporary and portable, usually round in varying diameters, and usually constructed from simple semi-rigid materials such as wire fence or plastic mesh fencing of several types, and best of all, fairly inexpensive. These bins can be 24” to 48” in diameter and perhaps 36”- 48” tall. Welded fence wire or plastic mesh is readily available at hardware stores and many garden supply stores. Old-fashioned wood and wire snow fence is another choice. Ideally you should be able to purchase by the foot for your needs but many of the materials come in rolls of about 25-feet in length. Determine the radius of the bin you wish to build and then calculate for circumference. A bin with a 24” radius (48” diameter) would require about 12’-6” of material. A 25-foot roll would provide enough fencing for two bins as an example. The ends of the fencing can be connected in many ways. Easiest perhaps is using inexpensive, UV resistant, nylon cable ties that are easily applied and are expendable when you want to dismantle the bin for screening and cleaning. Don’t make the bin any deeper than you can comfortably reach into the bottom. The bin can be stabilized by setting metal fence posts or tall wooden stakes at three or four equidistant points on the perimeter. The volume of a bin 36” tall would be about 1.4 cubic yards, an ideal amount of matter for decomposition and for screening. A technique sometimes referred to as “lasagna composting” where layers of nitrogen rich and carbon rich matter are alternately layered in the bin can be considered for this and a number of other bins or enclosures. It is not necessary to completely fill the bin before sorting finished compost from that which has not decomposed. Some matter will breakdown more quickly than other materials and you can judge when the compost is finished accordingly.

Enclosure systems: Considered more permanent are what I'll refer to as compost enclosures. These structures have the advantage of remaining useful for a long time and offering a continuous process that can be cycled through with some regularity throughout the year. These enclosures very frequently consist of two or more adjacent similar structures that can contain compost materials in different stage of decomposition. A typical 2- or 3-enclosure system would have the primary space for adding new material, a secondary space for unfinished matter left after screening of primary material, and optionally, a tertiary space for finished compost not immediately needed in the garden. These enclosures tend to be rectilinear in design with solid partitions between spaces. They could be round but square or rectangular forms take advantage of the shapes found in materials selected for construction. The list of potential materials is lengthy. They can be new, used, or salvaged from a previous life. Concrete block, used brick, scrap lumber, used shipping pallets, new or repurposed welded fence wire or chain link fencing, or purpose built commercially available components are some of the available choices. One could surely think of other products as well. The goal in any event is to construct a durable enclosure that can safely contain the organic matter to be composted, will prevent access by vermin, is visually acceptable in the planned location, and is easily accessible to the user for maintenance purposes. One can find dozens of design ideas by simply Googling "Compost Bins" on line. Let imagination, creativity, and financial considerations be your guide. The determining factor in design is how large to make the enclosures. For home composting, generally a one-cubic-yard volume should be more than adequate. Anything larger becomes unwieldy to maintain. As an example, each one of my 2-unit enclosures measures 3' x 3' x 3' and consists of preformed steel corner brackets connected by 1 x 6 cedar boards creating a louvered appearance. It exceeds my needs at this point in my gardening career. The overall cost of this setup which also included a large concrete paver surface was about four times the cost of the predecessor system built from found and salvaged materials but which was wholly unattractive for the 15 years it existed. Were I ever to rebuild the current setup, I would build slightly smaller and add a third enclosure.

Commercial Static Composters: A search of various catalogs and our friend, the Internet, for static compost bins will produce a large number of such devices. I found at least a dozen different designs in just moments. The guiding principle for most of these lies in simplicity and ease of access. Most involve adding fresh organic matter through a top hatch, allowing decomposition to occur over time and then retrieving finished compost at some time in the future via an access panel at the base of the structure. In theory, little or no maintenance is required. In my experience with one such device, I found the operation to be very simple but the amount of time required for completion and the very limited volume of finished material was disappointing at best. As to price, such devices were found ranging from under \$60.00 to nearly \$500.00 depending on design and vendor. Your mileage may vary, but I feel that there are better options available.

Rotary Composters/Tumblers: A more efficient, and in some cases a more rapid, method of obtaining finished compost involves the use of a rotary composter. If you were so inclined, you could build your own, but there are now any number of inexpensive commercially available units that would meet your needs admirably. Numerous vendors offer single- or double-bin devices varying in capacity from about 17 gallons upwards to about 100-gallon capacity. They are offered in galvanized or painted steel or UV resistant, high impact polystyrene or polypropylene in a number of designs. Some are available with rolling collection carts for transporting finished compost. Prices range from under \$70.00 to about \$500.00; most were found in the \$300.00 range. These devices typically rely on frequent mixing of fresh and partially broken down organic matter in a warm, moist atmosphere.

Frequent turning allows even distribution of moisture, aeration of the matter, and lets microbial, bacterial, and insect digesters be in continual contact with their food. The drums either rotate on a central axle passing through the center of the drum and supported by a support structure or the drum rests on a set of casters that allow rotation either by hand or by turning a geared crank that makes turning easier. You can imagine the effort required to turn a drum weighing upwards of 100 pounds. A crank seems a better option as it offers significant mechanical advantage, especially with heavier weights. Comparison shopping for features, ease of operation, and price is particularly important when considering these products. Caution should be exercised when considering metal products that are prone to rust and corrosion as many of the organic materials could react inappropriately with bare metal or painted finished surfaces.

Thoughts on covering the compost pile or bin: While it is perfectly possible to leave a working compost pile or bin completely open to the elements with no regard to amounts of rain, snow, heat, cold, or oxygen, it's useful to attempt to maintain constant levels of these factors if possible. Like so many things we encounter in gardening, here is another area in which to consider the "Goldilocks Effect." In other words, as much as feasible, we'd like all these factors to be "just right." Ideally we want to avoid peaks and valleys of temperature, moisture, and oxygen. A pile temperature of 90°F to 140°F, a moisture level between 45% and 60%, and an oxygen level of between 5% and 15% would be ideal for aerobic decomposition. Note that pile temperature will decrease as decomposition slows near completion. The use of a waterproof or water repellent cover material that can be easily added or removed as necessary can be effective in stabilizing these factors. Salvaged EPDM synthetic rubber roofing material, if available, is very effective as are more readily available items such as repurposed shower curtains, drop cloths, and closely woven tarpaulins. Any covering material should be well supported to allow rain or snow melt to drain off without pooling and risking collapse of the cover material.

Thoughts on screening finished compost: Even well-matured compost is very likely to contain debris that has not completely broken down. You probably don't want those items mixing with your garden soil as you amend it with your new compost. To that end, a means of screening out foreign matter is called for and can be created with minimal carpentry skills. For example, constructing a rectangular frame of 2 x 4 dimensional lumber set on edge and securely fastened at the corners with 4" long, exterior grade screws is pretty straightforward. Galvanized ½" or ¾" hardware cloth is then stretched and securely attached to the narrow surface of the frame with closely spaced, heavy gauge fencing staples. Any larger opening will allow undesirable material to pass through. On my screen that measures 3 feet x 7 feet, I added an additional layer of scrap 1 x 2 over the underside of the frame to assure that the screening can't come loose. Knowing that continued use will eventually cause the screen to sag, I also placed an additional support across the frame at the midpoint to reduce that possibility. In addition to this larger frame that I use to screen material directly from the compost bins into storage containers I made a second, smaller frame of similar construction that fits neatly over the edges of a wheelbarrow so I can screen either compost or soil at areas remote from the composting site. The effect of this is to separate organic matter that has not broken down as well as non-degradable items like fruit pits, large twigs, and similar undesirable debris from the finished compost. The result is compost that is uniform in texture and particle size and is of good tilth that is easy to incorporate in gardens or flower beds.

And so, if this all sounds like just way too much work, remember that any of the processes can be scaled back to suit your specific needs and capabilities resulting in an outcome that satisfies YOU.

2024 Master Gardener Horticulture Training Class



2024 MASTER GARDENER TRAINING

Tuition \$125.00



Classes are Tuesday evenings 6:00pm-8:00pm
March 5, 2024- June 11, 2024

Classes held at CCE Cattaraugus:
28 Parkside Drive Ellicottville, NY
Zoom option is available

Open to
Cattaraugus &
Chautauqua
County Residents

Apply online, print and mail application or stop by the office

<https://cattaraugus.cce.cornell.edu/gardening/master-gardener-volunteer-program>

Master Gardener Volunteers are individuals from the community who enjoy gardening and use their horticultural skills and expertise to educate others. In return for their training, Master Gardener Volunteers donate their time teaching the community about gardening and the environment.

Subjects included in the training program include:

• Garden Botany • Herbaceous and Woody Plants • Garden Design • Integrated Pest Management • Lawn Care • Nuisance Wildlife Management • Native Plants • Soils, Fertilizers and Composting • Pruning • Vegetable Gardening • Invasive Plants and Pests



Community Workshops

Visit our website to register

cattaraugus.cce.cornell.edu/events

<https://chautauqua.cce.cornell.edu/events>



Learn, Empower, Achieve, Farm February 2024 LEAF Workshops

Striving to diversify and grow agriculture in Chautauqua County by connecting our area's residents, homesteaders, and farmers to educational resources.

Knitting 101

Monday, 2/5, 5:00 - 7:00 PM / \$10 per person

Gain a new appreciation for local wool and relax with a fun group of crafters in this knitting workshop. All skill levels welcome (including beginners) and materials provided for in-person attendees!

Native Plant ID and Winter Seed Sowing

Wednesday, 2/7, 6:00 - 8:00 PM / \$5 per person

Native plants and trees are beneficial for the land and local wildlife. Join **Jonathan Townsend** of Royal Fern Nursery for an overview of native plant identification and learn how to start native plants from seed.

From Frost to Feast

Thursday, 2/15, 6:00 - 8:00 PM / \$5 per household

Season extension is a suite of techniques in fruit and vegetable production that allows harvest 12 months of the year. CCE Vegetable Specialist **Judson Reid** will discuss approaches such as variety, planting dates, row cover, high tunnels, and greenhouses.

Integrated Pest Management & Pesticide Safety

Wednesday, 2/21, 6:00 - 8:00 PM / \$5 per household

There is a lot out of our control when growing crops and gardens, but luckily we have lots of options to address pest control! Start the season strong with tips and safety basics from **Katelyn Miller**, Field Crops Specialist.

Soil, Water, Conservation, and You

Wednesday, 2/28, 6:00 - 8:00 PM / \$5 per household

Addressing landscape concerns or starting up improvement projects on your property can be overwhelming. Soil & Water Conservation District Field Technicians **Greg Kolenda** and **Gage Lindell** will give an overview of available resources, share local stories, and answer questions about how the SWCD and NRCS might be able to help you.

Join in-person at JCC Carnahan (241 James Ave, Jamestown)
or watch virtually on Zoom.

Register online at <https://bit.ly/LEAF2024> or call 716-664-9502

MASTER GARDENER LUNCH & LEARN SERIES

Lunch & Learn Master Gardener Educational Series (Tuesdays, Noon-12:30pm)

Join via Zoom or In-person at your county CCE
office (Ellicottville, Jamestown)

Raised Bed & Container Gardening

Join Master Gardener apprentice Melanie Brown as she shares tips and tricks to growing in containers and raised bed. Melanie will discuss what you should know when planning and planting your raised beds or container gardens.

Tuesday, March 12, 2024

Noon-12:30pm

Food Preservation "Scavenger Hunt"

Are you interested in learning how to preserve your food? The internet has so much information it can be overwhelming to find reputable sources for safe methods. Join Cornell Cooperative Extension Master Preservers on a "scavenger hunt" and learn how to identify tested recipes. We will discuss safe canning practices and other preservation methods to help you on your journey!

Tuesday, March 26, 2024

Noon-12:30pm

Integrated Pest Management (IPM)

Are you looking for options to get rid of pests in your garden without using pesticides? Join CCE-Master Gardeners and learn about Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices.

Tuesday, April 23, 2024

Noon-12:30pm

SAVE THE DATE

GARDENING SYMPOSIUM

SPONSORED BY CHAUTAUQUA COUNTY MASTER GARDENERS

SATURDAY, MAY 4, 2024
9am – 3pm

Keynote Speakers
Betsy Burgeson and Andrew Johnson
Presentations by Master Gardeners and The BioDome Project

Registration Open _____

Admission \$30 / Master Gardener (any county) \$20

Held at Jamestown Community College –
Carnahan Jackson Building, Jamestown, NY

Community Resources

Seed Libraries

Many local libraries have opened free seed libraries to encourage community members to garden and grow some of their own food!

The list is growing, below are a few libraries that are participating. Feel free to donate any seeds to help their seed library grow.

Ashville Free Library (Ashville NY) ashvillelibrary.com

Meyers Memorial (Frewsberg, NY) meyerslibrary.org

Anderson-Lee (Silver Creek, NY) andersonleelibrary.org

Mayville Library (Mayville, NY) mayvillelibrary.com

Seneca Nation Library (Salamanca NY)

James Prendergast Library (Jamestown, NY)
prendergastlibrary.org

Alexander Findley Community Library (Findley Lake, NY) findleylibrary.org

Darwin Barker Library (Fredonia, NY) barkerlibrary.org

SWARM REMOVAL NEED HELP REMOVING A HONEY BEE SWARM?

The beekeepers listed below have indicated that they provide bee removal services. The following contact information is provided as a public service and is not an endorsement of any of the beekeepers listed. AGM does not license or issue permits to remove honey bees. In addition, AGM does not have any information regarding a beekeeper's qualifications or training to remove honey bees.

View the list
agriculture.ny.gov/swarm-catcher-list



NEW YORK STATE
Agriculture and Markets

Free Pressure Canner Testing

Do you have a pressure canner with a dial gauge? It is recommended that gauges be tested annually.

**CCE-Chautauqua and CCE
Cattaraugus offer free testing!**

**Contact the office for an
appointment today.**

Master Gardener Help Desk Is Open during the growing season April-Sept

Questions can be asked during “off-season” by staff

Our master gardeners are ready to help with your garden question, identification or issue. Our garden experts will review your request and set you in the right direction. Also, as an extra bonus if you bring in a soil sample, our garden team will test for pH. pH is important for the adsorption of nutrients in your soil.



Cattaraugus County

Contact us at 716-699-2377
e-mail us at cattaraugusmg@cornell.edu

Helpline hours: Wednesday, 1:00pm-3:00pm

visit us at 28 Parkside Drive Ellicottville, NY 14731

Chautauqua County

Contact us at 716-664-9502 extension 224
e-mail us at chautauquamg@cornell.edu

visit us at the JCC Carnahan Center
525 Falconer Street

Helpline hours: Wednesdays noon-2pm

GPS address: 241 James Ave, Jamestown, NY

Native Plants



Diervilla lonicera
Northern Bush Honeysuckle



Viola Labradorica



Heliopsis



Rudbeckia triloba
Brown Eyed Susan



Asclepias tuberosa
Butterfly Milkweed



Geranium maculatum
Wild Geranium

GARDEN TIPS & TRICKS

Late winter/early spring is the best time trim and prune some shrubs, trees, and vines. If they are deciduous that drop their leaves in the fall and do not have spring blooms, they can be pruned at this time



"LITTLE TOGS"

(The Optimistic Gardener)



KID'S CORNER

DYI Seedling Pots - Helping children make their own seedling pots is a fun way to recycle things normally thrown away. Use items such as cardboard egg cartons, half an egg shell (crack shell when planting seedling in the ground), toilet paper tubes (cut in tube half and cut 4 half inch slits on end, fold to cover bottom), newspaper (purchase a “newspaper pot maker from Amazon or Walmart.com or other places)



References:

Compost topics are suggested in the individual URLs.

<https://ccetompkins.org/resources/compost-choose-your-compost-bin>

<https://ccetompkins.org/resources/compost-welded-wire-bin-for-compost>

https://s3.amazonaws.com/assets.cce.cornell.edu/attachments/62126/THE_JOY_OF_COMPOSTING.pdf?1684423905

<https://cwmi.css.cornell.edu>

<https://compost.css.cornell.edu/monitor/monitortemp.html>

<https://lancaster.unl.edu/trench-composting>

<https://www.popularmechanics.com/home/g39813014/best-compost-tumblers>

<https://compost.css.cornell.edu/monitor/monitormoisture.html>

Cornell Cooperative Extension of Chautauqua County is your resource for information on soils, site improvement, plant selection, proper plant care, eco-friendly practices, integrated pest management, composting and so much more! We offer free or low-cost gardening classes and tours all year long, and opportunities to share your love of gardening as a volunteer!



Interested in Agricultural Resources?

Checkout Agriculture Program Subscription

Access to Chautauqua or Cattaraugus County Cornell Cooperative Extension **Agriculture** Program services are granted upon program subscription. All subscriptions cost \$65, this includes the "Extension Connection" and other general mailings, Newsletters as well as the opportunity receive services from our regional teams, Lake Erie Regional Grape Program, Cornell Vegetable Program and Southwest NY Dairy, Livestock and Field Crops Program.

Additional fees may be necessary for print mailings of regional newsletters.

Please contact the below CCE locations if you are interested in subscribing to the Agriculture Program Subscription.

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Cornell Cooperative Extension

Chautauqua County

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<https://cattaraugus.cce.cornell.edu/gardening>

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