July 2023-Vol.9, No.7

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The Edible Garden in July

By Ralph Morini | July 2023-Vol.9, No.7

As we enter the heart of the summer growing season, spring plants may already have finished, summer vegetables are in full swing and we increase our focus on moisture management, insect and disease issues and caring for idled beds. There is still time to plant warm weather crops like beans, cucumbers, eggplant, melons, okra, peppers, pumpkins, squash, corn, sweet potatoes and tomatoes. With an average first frost date of October 15-25 in our hardiness zone 7a, pay attention to the time-to-harvest information of the crops you plant to be sure you give them enough time to mature before frost risk. Also, if you plan to make a fall planting, consider crop rotation and companion planting to reduce disease and pest risks. Also consider the sun blocking effects of tall and trellised plants based on the needs of the new crop plantings.

Check the Vegetable Harvest Guide from the Iowa State Extension for typical time from seed planting to harvest for common garden vegetables. For a listing of recommended planting and harvest times for hardiness zones 6a-8a refer to VA Cooperative Extension (VCE) publication Virginia's Home Garden Vegetable Planting Guide.

Planting time for fall crops like lettuces, cabbage family crops and greens begins in early to mid-August, so begin to prepare beds for those plantings. Remove spent plants. Compost them if not diseased and if they haven't set seed. Otherwise, it is best to dispose of them.

Screening compost. Photo: R Morini

If you started a compost batch in the spring, and kept it moist and aerated, it may be ready for use now. Screen it to separate fully and partly decomposed material. Put undecomposed material back in the bin, while adding finished compost to beds, prior to planting, to give fall plants a boost. Organic fertilizers can also be added to beds prior to planting to give soil life a chance to make nutrients accessible to the new crops. Find basic fertilization info in the Garden Shed article A Fertilization Primer: Plant Needs, Fertilizer Choices and Application Tips.

Maintaining Plant Health

Rotating crops is an important priority to minimize disease and pest proliferation. A three-year cycle is recommended. Interplanting or mixing a diversity of crops into shared space is a good practice too.

Splashing soil onto plants during watering is a common mistake that can spread soil borne diseases onto crops. Water at the plant base, as gently as possible to minimize splashing. Watering early in the day gives vegetation time to dry, reducing risk of fungal disease. A light straw or leaf mulch can reduce soil splashing while helping to conserve soil moisture during hot, dry summer weather.

Advice for Tomato Growers

Tomatoes are a prized summer crop for many of us. It is best to support plants with stakes or cages. If you use **stakes**, tie plants loosely to the stake with a soft twine or cloth strip. Add ties to give support as plants grow and fruits develop. Remove leaves that touch the ground to reduce susceptibility to soil pathogens. Allow up to two main stems and pinch off all other “suckers” that sprout at leaf/stem intersections. This focuses the plant on fruit production rather than vegetative growth.

Sucker at tomato leaf-stem joint: Photo: R Morini

Cages require more upfront investment and off-season storage space but reduce plant maintenance during the growing season. If you use cages, prune plants to 3 or 4 main stems. The additional vegetation will help protect fruit from sun scald.

In all cases, remove diseased foliage with shears disinfected with a 10% bleach solution. Bag and remove it with your trash. As noted above, mulching helps maintain moisture, hold down weeds, and reduce soil splash during watering.

A more complete guide to growing tomatoes is provided in the VCE publication Tomatoes. If you have disease issues, check the Garden Shed article Tomato Diseases.

If you are having disease or pest issues, record the timing and specific issues in your journal. This info can assist in selecting resistant varieties next season.

Summer Pests

Summer is the peak activity period for many garden pests. Get help dealing with common pests from the Garden Shed article Eleven Common Garden Pests: Identification and Management.

For more help identifying beneficial insects check the video Garden Insects: Friend or Foe, from the University of Georgia Extension.

More ideas to help maintain garden health during July:

- **Watering is** extra important in the hotter months, affecting overall plant health, and the taste and texture of many vegetables. The garden typically needs about an inch of water per week,

more during very hot periods. Early morning is the best time to water: it gives leaves time to dry before dark and reduces susceptibility to fungal diseases.

Rain barrel hidden by viburnum. Photo: R Morini

- **Rain barrels** are a great tool for reducing summer water use. They can reduce runoff, conserve water resources, and reduce water/sewer bills. Natural rainwater is also better for plants than chlorinated water. Rain barrels are located alongside downspouts and connected via a pipe or tube. Rainwater passes from the gutter to the downspout and through a diverter that sends it to the barrel. When the barrel is full, excess rainwater is sent down the downspout. Rain barrel water isn't considered potable and can pick up pathogens from fecal matter on roofs, so should be applied to the base of plants, not sprayed on foliage. The benefits of rain barrels are discussed in the publication Rain Barrels in the Home Garden from the U of Minnesota Extension.

Stirrup hoe weed removal. Photo: R Morini

- It’s important to **control weeds** around vegetables because weeds can out-compete vegetable plants for nutrients, water, and sunlight. The best method of control is by mechanical extraction, meaning good old-fashioned weed-pulling or the use of a hoe. For small weeds, the **“stirrup” hoe** (also called “hoop” or “scuffle” hoe) is recommended because its shallow soil penetration removes weeds without bringing buried seeds to the surface where they can germinate. It’s also easy on the knees and back.

Fusarium wilt of basil (Fusarium oxysporum f. sp. basilicum) Debbie Roos, NCSU Agricultural Extension Agent, Chatham County, NC

- **Fusarium wilt of Basil** is a fungal disease specific to sweet basil. The fungus attacks the water-conducting tissue (xylem) within the stem. Infected plants will grow normally until they are six to twelve inches tall, then suddenly wilt. The stem may become curved and develop brown streaks. The fungus can over-winter and survive many years as spores, ready to cause new infections in basil or other mint family members that are planted in the same soil. There is currently no fungicide approved for its treatment, but it can be controlled somewhat by removing diseased plants, rotating planting locations, and by planting disease-resistant varieties. Some resistant varieties include Aroma-2, Prospera and Obsession. Also, Lemon and purple basil varieties show resistance to the disease. Additional information is available from the UMD Extension publication Fusarium Wilt of Basil and from Garden Shed article Basil: Beautiful and Aromatic.
- **Cucumbers** develop a **bitter taste** if the soil is not kept **consistently moist. Leaf or straw mulch** can help maintain soil moisture.
- **Reduce potato watering when flowers mature. Pick them after flowering when the vines dry up.** Water and fertilizer may disturb the dormancy stage causing regrowth and may cause potatoes to crack. Great guidance for growing potatoes is available from this article from the Michigan State University Extension.
- Pests and diseases are very active during the summer. It is tempting to use manufactured chemicals to deal with them, but for environmental and health reasons we recommend following

Integrated Pest Management principles in dealing with these issues. The Garden Shed article Integrated Pest Management provides good guidance.

- If you use **insecticides on vegetables** (we hope you don't), avoid spraying flowers and check the label to understand how long to wait after application before safely harvesting and eating. Please avoid neonicotinoids which present high risk to pollinators.

I hope this information is helpful and that we can talk again next month as fall planting and soil care issues take the spotlight. Meanwhile, enjoy July.

Sources:

Feature image: Mid-June Edible Garden, Photo: R Morini

Preserving Food: A Guide to Freezing Vegetables

By Patsy Chadwick | July 2023-Vol.9, No.7

If your vegetable garden is like mine, it goes into overdrive around mid-summer producing overwhelming amounts of produce. Those seeds and tiny transplants that we planted in spring magically morph into monster-sized plants producing gallons of tomatoes, beans, peppers, and corn. And don't get me started on those overachieving summer squash and zucchini plants!

Naturally, if your garden plot produces enough produce to share with others, the local food banks and your friends and neighbors will appreciate your generosity. Any produce you don't eat fresh from the garden or share with others can be preserved by canning, dehydrating, brining, etc. While these methods of preserving food bring us a deep sense of accomplishment, they also require a commitment of time and effort. But what if you don't have the time, energy, or equipment these methods require? Under those circumstances, freezing your surplus veggies may be the answer. The point is not to let any food go to waste.

WHY FREEZE VEGETABLES

Several excellent reasons come to mind for freezing vegetables:

- **Convenience**. Preserving vegetables by freezing them is quick, simple, and doesn't require any special equipment. Also, produce can be prepared for freezing in small quantities of a pound or two at a time, which most people can easily manage.
- **Cut down on Food Waste**. American consumers waste an alarming amount of food daily. If the vegetables in your crisper drawer routinely wither, go limp or turn moldy, then consider freezing them **before they go bad**.

- **Extend "Shelf life**." Blanching (more on that later) and freezing vegetables is a good way to enjoy them all year long and not just when they are at peak in the summer months. If kept frozen at 0°F or lower, most vegetables will maintain high quality for up to 12 months or more.
- **Retain nutritional value**. Clemson University Extension's Factsheet HGIC 3063 states that freezing is "the method of food preservation that preserves the greatest quantity of nutrients." For best overall quality, produce should be frozen when it is young, tender, and at its peak of flavor. Ideally, it should be frozen as soon as possible after it is harvested – preferably within hours.

Even if you don't grow your own vegetables, you can buy them from grocery stores or farmer's markets when they are in season, freeze them, and enjoy them all year long.

FREEZING BASICS

Although you can freeze just about any vegetable, some hold up better than others to being frozen and thawed. You can't, for example, expect to achieve the same crisp results using thawed vegetables as you would get from roasting fresh ones. You can, however, expect excellent results using previously frozen vegetables in cooked foods such as soups, stews, casseroles, and frittatas.

Vegetables with a low moisture content generally hold up well to being frozen. Some examples include broccoli, carrots, cauliflower, corn, green beans, peas, squash, and sturdy greens such as chard, collards, kale, and spinach. Other vegetables such as onions, peppers, and celery may also be frozen, but the results are generally not as good as those vegetables having a lower moisture content. Vegetables with a high moisture content such as cucumbers, green onions, lettuce, and radishes do not freeze well. Once they are thawed, the texture can be mushy and watery. Whole tomatoes also don't freeze well because of their high moisture content. However, they freeze quite well if they are first processed into tomato juice, puree, sauce, or paste.

Before you start prepping your produce for freezing, decide how you want to use it in future meals. Vegetables that are cut into a small or medium dice work well in soups. Ones cut into large dice or chunks are suitable for stews or casseroles that will be simmered or baked for a long time. Vegetables that will be layered in casseroles generally work best sliced into rounds. By making those decisions now, you are basically doing all the prep work for meals up front as you prepare to freeze your produce.

BLANCHING BASICS

With some exceptions, most vegetables should be blanched before they are frozen. Blanching is a quick and simple process. It involves briefly plunging small quantities of vegetables into a pot of boiling water to:

- Deactivate natural enzymes that cause food to deteriorate.
- Set or brighten the color of the food.
- Clean dirt and microbes from the surface of the food.
- Help slow the loss of vitamins and minerals.
- Soften food, which makes it easier to pack into containers.
- Loosen the skins of tomatoes to make them easier to peel.

To blanch vegetables, you will need the following equipment:

- A large saucepan with lid
- A wire basket, perforated metal strainer, or cheesecloth bag for submerging the vegetables into the pot of boiling water.

- A large bowl filled with cold water and ice for rapidly cooling the cooked vegetables.
- A slotted spoon for removing the cooled vegetables from the ice water bath.
- Freezer-safe storage containers such as plastic freezer bags, rigid plastic containers, or tempered (freezer-safe) glass jars.
- A marker or pen for labeling the contents of the containers and the date.

Timing the blanching process:

Timing is very important for overall high quality of blanched vegetables. If vegetables aren't blanched long enough, enzyme activity may continue during frozen storage, resulting in off flavors, off colors, and toughening. Vegetables that are blanched too long may lose some of their flavor, texture, and color.

The length of time needed for blanching depends on the vegetable being blanched and the size of the pieces. The National Center for Home Food Preservation recommends the time needed to blanch the following selected vegetables:

- Asparagus: 2 minutes for small, 3 minutes for medium, and 4 minutes for large stalks
- Beans (green, snap or wax): 3 minutes
- Broccoli flowerets (1.5" across): 3 minutes
- Brussels Sprouts: 3 to 5 minutes depending on the size of the sprouts
- Cabbage (shredded): 5 minutes
- Carrots: 2 minutes for diced or sliced; 5 minutes for whole or small
- Cauliflower flowerets (1.5" across): 3 minutes
- Celery (diced or sliced): 3 minutes
- Collards: 3 minutes
- Corn kernels: 4 minutes (blanch on the cob, cool and cut off kernels); 7-11 minutes for corn on the cob depending on whether the ear is small, medium, or large
- Eggplant (cut into 1/3-inch slices): 4 minutes
- Kale: 2 minutes
- Okra: 3 to 4 minutes
- Peas (shelled): 5 to 2.5 minutes
- Potatoes: 3 to 5 minutes
- Spinach: 2 minutes
- Summer squash (cut into 1/2-inch slices): 3 minutes.

Steps for blanching vegetables:

- Wash vegetables thoroughly and rinse several times before cutting them to remove dirt, debris, pesticide residue, and bacteria.
- Cut vegetables into a **uniform size** suitable for use later in recipes.
- For each pound of firm vegetables (about 4 cups), bring one gallon of water to a boil in a large pot or two gallons of water for each pound of leafy greens (about 8 cups).
- While water is coming to a boil, fill a large bowl with cold water and ice cubes and set aside.
- Place the prepared vegetables in the wire basket and lower it into the vigorously boiling water. Cover the pot. If the water stops boiling, wait until it comes back to a boil before you start timing the blanching process.
- After the vegetables are finished blanching, remove them from the boiling water and immediately dip them into the bowl of ice water until they are completely cool.
- Remove the cooled vegetables from the water and pat them as dry as possible. Any extra moisture can decrease the quality of the frozen vegetables.

Steaming as an alternative to blanching

Some vegetables, such as broccoli, winter squash, sweet potatoes, and pumpkin, may be blanched using steam as opposed to boiling water. Either method will work, but steaming takes about 1-1/2 times longer than water blanching.

To steam vegetables, bring 1" to 2" of water to a rapid boil in a saucepan that can accommodate a steamer basket. The steamer basket must hold the food at least 3" above the bottom of the pan. Arrange cut up vegetables in a single layer in the steamer basket. Place the basket over the boiling water and cover the pan with a tight-fitting lid. Start counting the steaming time as soon as the lid is in place.

Packing vegetables for freezer storage

After blanched vegetables are cooled and dried off, you have two choices for packing them for freezer storage:

- **Packing Choice # 1**: Quickly package them into freezer containers. If using plastic freezer bags, press out as much air as possible to prevent freezer burn and to keep the food from drying out. Leave ½" to 1" of headroom space at the top of the bag (to allow for any expansion during the freezing process). Seal the container tightly, label it, and store it in the freezer at 0°F or below.
- **Packing Choice # 2**: This is a two-step process, which takes more time and effort but may make your life easier later. Arrange the cooled and dried off vegetables in a single layer on a shallow tray (or sheet pan). Place the tray in the freezer **just long enough to freeze the vegetables firm but no longer than that**. Otherwise, the exposure to the dry freezer air will affect the quality of the produce. Remove the frozen produce from the freezer and promptly package it for storage (without headspace, since the produce is already frozen). Tightly seal the container, label it, and store in the freezer. This approach prevents the vegetable pieces from freezing into a solid block, which makes it easy to remove a portion of the vegetables from a container and return the rest to the freezer.

Individually frozen broccoli florets before being stored in containers. Photo: Pat Chadwick

TIP: For best results, avoid stacking containers of vegetables on top of one another. Place them in several areas of the freezer so that they freeze faster.

FREEZING HERBS

Herbs may be frozen but they become limp as they thaw. However, the limp herbs are perfectly suitable for adding flavor to cooked foods. To freeze herbs, simply wash, drain, and pat them dry to remove excess moisture. They don't need to be blanched before being frozen. Trim, chop, and bag for freezing. The frozen

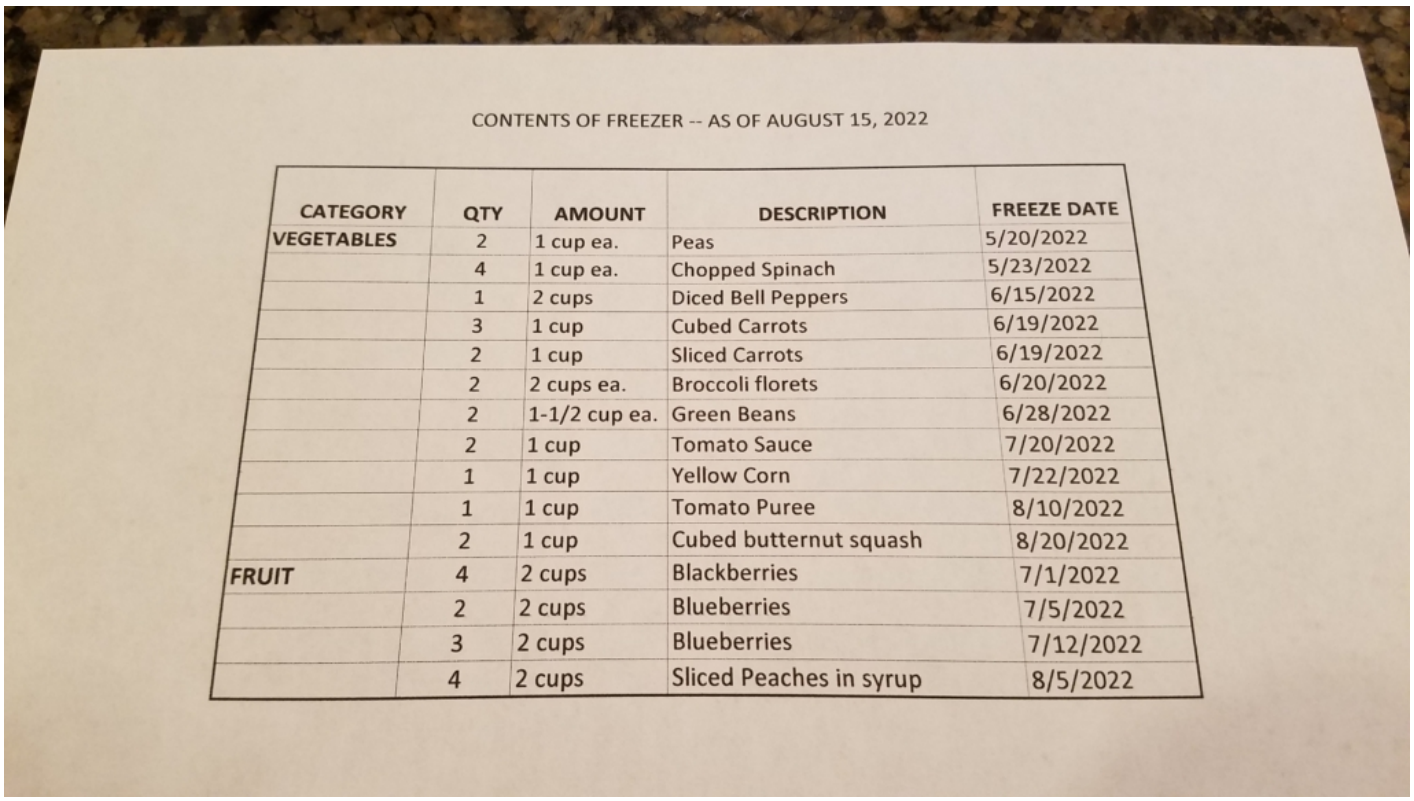
herbs may be added directly to food that is being cooked.

An alternative method for freezing herbs is to cover them in water and freeze them as ice cubes. For this method:

- De-stem and chop herbs just as you would if you were using them fresh.
- Partially fill an ice cube tray with water and place about a tablespoon of chopped herbs in each section.
- Push the herbs under the water and place the tray in the freezer.
- After the cubes are solidly frozen, add additional water to top off each cube and return the tray to the freezer.
- After the cubes are completely frozen, pop them out of the tray and transfer them to a freezer bag.
- Add the frozen ice cubes directly to soups, stews, sauces, or other cooked foods.

A FINAL THOUGHT ON FREEZING VEGETABLES

The thought of filling my freezer with produce from my garden gives me great satisfaction. However, it's all too easy to lose track of what's in the freezer. Vegetables will last a good long time when frozen but they do eventually lose flavor, color and texture if not used within a year or so. A simple way to keep track of your freezer contents is to tape a list of them to the freezer door. List oldest items first and newest items last. As you use each item, cross it off the list. That way, you have a visual reminder of what is in the freezer, the date each item was frozen, and a reminder to use the oldest items while they are still at maximum flavor and texture.



CONTENTS OF FREEZER -- AS OF AUGUST 15, 2022

CATEGORY	QTY	AMOUNT	DESCRIPTION	FREEZE DATE
VEGETABLES	2	1 cup ea.	Peas	5/20/2022
	4	1 cup ea.	Chopped Spinach	5/23/2022
	1	2 cups	Diced Bell Peppers	6/15/2022
	3	1 cup	Cubed Carrots	6/19/2022
	2	1 cup	Sliced Carrots	6/19/2022
	2	2 cups ea.	Broccoli florets	6/20/2022
	2	1-1/2 cup ea.	Green Beans	6/28/2022
	2	1 cup	Tomato Sauce	7/20/2022
	1	1 cup	Yellow Corn	7/22/2022
	1	1 cup	Tomato Puree	8/10/2022
	2	1 cup	Cubed butternut squash	8/20/2022
FRUIT	4	2 cups	Blackberries	7/1/2022
	2	2 cups	Blueberries	7/5/2022
	3	2 cups	Blueberries	7/12/2022
	4	2 cups	Sliced Peaches in syrup	8/5/2022

A simple inventory of what's in the freezer and the date it was frozen. Photo: Pat Chadwick

SUMMARY

As gardeners, we derive a great deal of satisfaction from the vegetables we grow in our gardens every year. But unless we are disciplined about the quantities we grow, it's easy to become overwhelmed by too much produce in our gardens. Donating some of the surplus to local food banks and sharing it with friends and neighbors are great ways to share the bounty and avoid wasting food. But if we still have more than we can use right away, freezing is a quick, easy, convenient way to preserve the surplus. You'll be happy you did when you find yourself enjoying corn on the cob from your freezer in January.

FEATURE PHOTO: Frozen vegetables from author's garden. Photo: Pat Chadwick

SOURCES

"Blue Book Guide to Preserving," (Ball Corporation, 2012)

Freezing/Blanching, National Center for Home Food Preservation, University of Georgia Extension.

Freezing Fruits and Vegetables, Clemson University Factsheet HGIC 3063

Freezing Fruits and Vegetables, Virginia Cooperative Extension Publication 348-596

Freezing Herbs, Pennsylvania State University Extension

Freezing and Food Safety, United States Department of Agriculture

How to Freeze Vegetables, University of Missouri Extension

Upcoming Events

By Cathy Caldwell | July 2023-Vol.9, No.7

Summer Tree Identification Walk: Ivy Creek Natural Area.

Saturday, July 1@ 9:30 to 11:00 a.m. REGISTER HERE

Join Tree Steward Emily Ferguson on this walk as she points out different leaf features that help identify trees. This is an easy-to-moderate walk over woodland trails that contain roots and rocks.

Garden Basics: Why Is My Plant Looking Unhealthy?—A Hands-on Workshop About Diagnosing Plant Problems

Saturday, July 15 *@ 2:00 pm – 4:00 pm*
Trinity Episcopal Church 1118 Preston Avenue, Charlottesville

Plant problems are often linked to a disease-causing organism or less-than-ideal growing conditions. This free, hands-on workshop will offer a systematic approach to uncovering the cause of a plant's problems, as well as examples of common plant problems in Virginia. Participants are encouraged to bring samples from their own gardens for the class to examine and diagnose — BUT NOT BOXWOOD SAMPLES.

Due to the hands-on nature of this class, space is limited. Registration closes at 5 p.m. July 14 or when the class is full. Garden Basics is a partnership with the Bread and Roses ministry at Trinity Episcopal Church.

RSVP HERE FREE

UVA Tree Walk
Sunday, July 16 @ 9:30 to 11:30

Limited to 15 adult participants
REGISTER HERE
Join Tree Stewards Dana Denbar and Carol Wise at the University of Virginia on this walk through a gently sloping area of paved walkways and grass, under a high canopy of trees. Enjoy beautiful surroundings as we discuss the history of some specimen trees as well as species identification and biodiversity function of

native and nonnative trees. This is an easy to moderate walk over both paved and lawn areas.

Blue Ridge Prism Summer Meeting: "These Are Not Your G'pa's Quail: Modern Bobwhite Quail Habitat Management"

Wednesday, July 19 @ 11:30 am – 1:00 pm

Free Live Webinar Register Here.

Louisa County Backyard Gardening Seminar Series

The Louisa County Master Gardeners present their 2023 Backyard Gardening Seminar Series. These seminars take place one Saturday a month from 10:30 – 11:30am at the Louisa Co. Public Library. The next sessions include:

- July 15: Vegetable Garden Diseases and Stress
- August 19: Native, Invasive and Riparian Gardening
- For more information call, 540-967-3422 ext 7619 or email: louisamg@gmail.com

Beekeeping

By Cathy Caldwell | July 2023-Vol.9, No.7

I should start by admitting that an article on beekeeping was not my idea. One of my fellow *Garden Shed* writers suggested the topic, and frankly, I doubted that it would be of interest to most gardeners — mostly because that was *my* dubious reaction. Oh boy, was I ever wrong. I dutifully set up an interview with the leaders of the area beekeeping community — Ken and Karen Hall — and after a minute or so of chatting with them, I became utterly fascinated by the connections between gardening and beekeeping.

I thought I knew all about pollination, but somehow I hadn't quite grasped what a miracle it is for life on earth. When bees come into our yards and fields, they are seeking food for their own survival; by doing so, these tiny creatures move pollen from one flower to another, making possible new fruits and seeds when pollen from a male organ of one flower is dropped on the female organ of a nearby flower. This marvel of reciprocity between plants and pollinators is more than a miracle; it's essential to life on earth. And it makes gardening possible! I will never gaze at bees buzzing around my plants in the same way ever again.

It was the interconnectedness of gardening and beekeeping that led to the Halls' involvement with bees. It all started when Karen, an avid vegetable gardener, learned that bees could improve her garden's yield. Eager for more cucumbers to pickle, Karen mentioned this to Ken, and he, in turn, mentioned it to a colleague who kept bees. The next thing you know, Ken had brought home a hive, and the rest is history. The Halls have been keeping bees for 28 years now.

The Halls do much more than simply keep bees; they teach a yearly introductory beekeeping class through Albemarle Parks & Recreation, serve as mentors to new beekeepers, and provide education to the public, including school children. I've witnessed just how fascinating the Halls' presentations are to kids, who can barely take their eyes off the glassed-in "observation hive" of live bees that the Halls bring along. Karen Hall also maintains the "Swarm List" — a service to members of the public who discover honey bees swarming on their property (more about this later). Both of the Halls are officers of the Central Virginia Beekeepers Association.

The western honey bee (*Apis mellifera*) is a non-native species that is managed for its pollination services to agriculture; thus, the honey bee is considered to be "domesticated" — like cows and sheep. In fact, the so-called western or European honey bee was brought to North America — to Jamestown — in 1622. This species of bees is preferred for commercial farm pollination because the population of their hives is unusually large; a single hive may have tens of thousands of individuals.

Honey bees are social animals, with three social castes within a hive: queen, worker, (female) and drone

(males), each having particular roles to play in the functioning of the hive. As I learned from the Halls, a hive is one amazingly complex operation which requires communication among its members.

Ken Hall described a particularly thrilling type of honey bee communicative behavior. If a worker bee finds a promising site for forage, it is able to share this information with other workers back at the hive. How? By performing the "waggle dance" — which signals not only the direction of the flowers from the hive, but also the distance from the hive! Having always thought of bees and other insects as rather mindless, instinct-driven creatures, I was more than a little surprised by Ken's description of this dance. Back home, I followed up with some research on the topic, and discovered that the waggle dance is only one of a number of forms of communication engaged in by honey bees. To read more about their behaviors and their division of labor, see the references at the end of this article, especially "Honey Bees as Pollinators, Their Habitats and Products," University of Missouri Coop. Ext. (2018) and "Pollinator Declines," Penn State Ext. (discussing hygienic behaviors of honey bees as well as a comprehensive analysis of the dramatic population decline that began in 2006).

Honey bees engage in some other behavior that was news to me: swarming. Swarming is the process by which some members of the hive, including the "old" queen, leave and set up a new home elsewhere, thus becoming "feral" bees. For an exhilarating description of this process, read "Frequently Asked Questions about Honey Bee Swarms," Clemson Coop.Ext. As the Halls put it, the departing bees "go from domesticated to feral," and unfortunately, "unmanaged feral colonies have an average life expectancy of only about 14 months."

Swarming honeybees. Photo courtesy of Central Virginia Beekeepers Association

How does beekeeping relate to gardening and food production?

By now you may have heard that one-third of our food supply depends on honeybees for pollination. In the U.S. there are fewer than 2,000 commercial beekeepers, a number that is concerningly small to those in-the-know like the Halls. These commercial bee operations move about the country, taking their hives to farms and orchards from Florida to California. You've no doubt heard about the needs of almond farms in California. From the Halls, I learned that there are about 700,000 acres of almonds, and that at least two hives are needed to pollinate a single acre; thus, this crop requires about 1.4 million hives.

The U.S. crops that are currently highly dependent on honey bees are:

- alfalfa
- almonds
- apples
- avocados
- blueberries
- blackberries
- cherries
- citrus (oranges, limes, etc.)
- cranberries
- cucumbers
- melons
- raspberries
- squash (including pumpkins and zucchini)

- strawberries
- watermelons.

The Halls explained that home gardens also benefit from the presence of honey bees, which boost yields, producing more and larger fruit, flowers, and vegetables. To learn more about the pollination services of both honey bees and wild bees, check out this Penn State article: "Who Are Our Pollinators?" Penn State Ext. ("With the recent declines in honey bee populations, researchers are looking more closely at wild bees and the work they do in agricultural crops.")

Is beekeeping difficult or time-consuming? Ken's initial answer to this question was "It's easy to get started, but harder to keep going." On the other hand, both the Halls enjoy the fact that, in beekeeping, "you're always learning." Part of the work involves monitoring for and treating diseases and parasitic mites. Most of us are aware of the large losses suffered by honeybees due to "Colony Collapse Disorder" beginning in 2006, but for the Halls, keeping up on the research on this topic is another opportunity to learn. Ken was also careful to point out that he has a full-time job, with beekeeping fitting nicely into the "side hustle" category.

How do plant choices affect honey bees?

Beekeepers must not only watch for and treat mites and diseases, they must also keep an eye on the nearby sources for nectar and pollen that are essential to bee nutrition and health. Pollen is a honey bee's source of protein; carbohydrates and some other nutrients come from plant nectar. The pollen from some plants is more nutritious than that of other plants; in addition, some varieties of plants provide more nectar and pollen than others. The nectar is also "stored in the pantry" — i.e., the honey bees use it to make honey to meet their nutritional needs during the winter.

Thus, beekeepers are vitally interested in the plants that feed their hives, especially early and late in the season. No surprise then that Karen Hall is a big fan of early spring bloomers like snowdrops, crocus, and hellebores, as well as flowering trees and shrubs. It is trees and shrubs that primarily meet the early spring needs of honey bees, with plants like clover taking over later in the season. If you're looking at add plants that support pollinators, you'll want to consult one of these helpful plant lists:

- "Blooms for Bees: How to Provide Pollen and Nectar Sources," Rutgers
- "Plants for Year-round Bee Forage," University of Georgia Bee Program

The University of Georgia is a leader in the field of bee research — along with Penn State and the University of Florida — and comes highly recommended by the Halls.

I now understand why we should all be interested in honey bees and the role they play in feeding us. And I'm eager to learn more about how scientists are working to understand the health hazards faced by honey bees as well as what we can all do to prevent the ongoing declines in bee populations.

SOURCES:

"Honey Bees as Pollinators, Their Habitats and Products," University of Missouri Coop. Ext. (2018).

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July in the Ornamental Garden

By Cathy Caldwell | July 2023-Vol.9, No.7

As any gardener knows from experience, July's heat and humidity can dampen our enthusiasm for working in the garden. However, a good strategy is to work in the cool hours of the morning or evening. Just 10 or 15 minutes a day maintaining your garden can make a huge difference in how it looks and performs. Here are a few suggestions (for new gardeners) or reminders (for seasoned gardeners) for keeping your garden looking perky and well maintained despite the heat:

Deadheading and "Deadleafing" a hardy geranium. Photo: Cathy Caldwell

Deadhead spent blossoms. Devote a few minutes each day to snipping or pinching off spent blossoms. Just choose one or two plants that need your attention and focus on those. The result will be a tidier looking garden with less stress and wear and tear on you. As a bonus, deadheading can trigger the production of more blossoms on many ornamental plant species.

Trim plants of old, tired, or tattered-looking foliage, flower stalks, or damage caused by pests or disease. Large-leaved plants, particularly hostas, look much more attractive if you trim off the leaves that have suffered heavy slug damage.

Selectively cut back or shear plants that have finished blooming to spur fresh new growth and perhaps some re-bloom as well. For general information on perennial plant care, see Care and Maintenance of Perennials/Penn State Ext and Growing Perennials/Clemson.edu. For the new gardener who would like more detailed information on perennial plant maintenance, Tracy DiSabato-Aust's book on *The Well-Tended Perennial Garden* is a useful, well-organized resource on the subject.

Stake or cage taller perennial species to keep them from flopping over or collapsing. Plants fall over for many reasons, including too much weight from flowers, too much moisture, too much shade, or overly rich soil. A number of plants may simply be cut back, pinched, or sheared to keep their height under control without loss of blooms. Goldenrod, asters, balloon flower, tall daisy species, catmint, and Boltonia fall into that category. Other plants should not be cut back but staked or caged instead to avoid damaging flower buds. Lilies, hollyhocks, foxgloves, and Crocosmias fall into this latter category.

Pinch back fall-blooming perennials, specifically chrysanthemums and asters, **before mid-July** to keep their overall dimensions under control and to prevent them from setting buds before fall. Do not pinch back these plants after mid-July because they won't have enough time to set new flower buds for the fall.

Neatly edge flower beds and replenish mulch as needed. This is one of the simplest and most effective ways to make your garden look fresh and inviting.

Monitor moisture levels. July is often the hottest month of the year and typically one of the driest. So, in the absence of adequate rainfall, provide supplemental water to plants as needed. Be water-wise and use drip irrigation or a hand-held hose or watering can to water slowly and deeply at the base of each plant. Infrequent deep watering is generally best for established plants. This encourages them to send their roots deeper into the soil, which helps them become more drought tolerant. Plants that are becoming established in the landscape should receive about an inch of water per week. Newly-installed trees and shrubs may require more water, particularly during their first year or two in the ground.

Keep the garden from looking crowded and overgrown. Dividing some of those overgrown perennial clumps and thinning them out will improve the overall appearance of your garden. While fall is preferable for dividing most perennials, some, such as bearded Irises, may be safely divided in summer in the absence of a drought. If you do attempt to divide your perennials in the summer, choose a cool, cloudy, or overcast day to do it. Water the plants deeply the day or evening before so that they are well hydrated. Dig them up, divide them, and plant the divisions right away so that the roots don't dry out. Cover the root zone with mulch to cool the soil and help retain moisture. Give the divisions some protection from the sun while they become established. Shade cloth or a row cover or even an old umbrella tilted at an angle can provide huge benefits as temporary protection from strong sunlight. Water early in the day for maximum benefit to the plants and continue to keep them well watered for the remainder of the summer. For detailed guidance on dividing perennials, see Guidelines for Dividing Perennials/The Garden Shed

Check containerized plantings daily for sufficient moisture levels. Potting soil dries out at the surface, but it may be wet deeper in the pot. Stick your finger into the soil about two inches. If the soil at the tip of your finger feels dry, then add water. Water the soil – not the leaves. Bear in mind that plants have different moisture needs. Succulents, for example, prefer to be kept on the drier side whereas many annuals prefer evenly moist soil. How often you need to water will depend on the planting medium used, the type of container, the amount of sunlight, and the plants themselves.

Weeding – This task never fails to be included on every "to do" gardening maintenance list during the growing season. It is one of those never-ending chores that most ornamental gardeners detest. But here's why it's important: Weeds compete with ornamental plants for moisture and nutrients, plus they have an amazing capacity for self-preservation. For example:

- **Oxalis (Yellow wood sorrel)** – This prolific annual weed is highly successful at reproducing itself. It looks innocent enough with its tiny yellow flowers and clover-leaf shaped foliage. But the flowers give way to seed capsules, which explode, throwing the seed several feet away.

Horsenettle (Solanum carolinense), Ohio State Weed Lab, Bugwood.org

Horse Nettle – This perennial weed reproduces by seed as well as by an extensive root system. If you dig it out of your garden (rather than use an herbicide), remove the entire root. Any root fragments left in the soil can remain viable for years and will wait patiently to sprout until growing conditions are ideal.

- **Crabgrass** – A summer annual, this weed certainly qualifies as one of the top ten nuisances in both the lawn and the ornamental garden. It germinates from mid-spring to mid-summer and reproduces by setting seeds and by rooting at the lower joints. To control it, dig it out by the roots and make sure you get every bit of the plant.

Tackle these and other weeds when they are small, easy to pull, and less likely to require an herbicide to control them.

ORNAMENTAL PLANT DISEASES

Powdery mildew – This easily recognized fungus appears as white or grayish talcum powder-like spots or splotches, usually on the upper sides of leaves. Powdery mildew affects a wide range of plants including crape myrtles, lilacs, garden phlox, sunflowers, zinnias, and dahlias, just to name a few. To avoid the problem in the first place, buy healthy plants. Select mildew-resistant varieties if possible. Space new plantings far enough apart to allow good air circulation. Provide adequate moisture and nutrients to keep them healthy. Remove any diseased plant material to help minimize the spread of fungal disease. If only a few leaves are affected, little, if any, action may be required. But if the problem is severe and a fungicide is called for, follow the manufacturer's directions carefully before applying the product to the affected plant.

Aster Yellows – This highly contagious viral-like plant disease is caused by a phytoplasma, a tiny organism that is spread from plant to plant by sucking insects such as leaf hoppers. This disease affects more than 300 ornamentals, vegetables, and weeds. It is characterized by chlorosis (yellowing of the leaves while the veins remain green), extreme leafy growth, and deformed flowers that often remain green or sometimes exhibit tufts of green foliage within a blossom or in place of a blossom. Some annuals and perennials affected by aster yellows include aster, coneflower, coreopsis, cosmos, chrysanthemum, petunia, snapdragon, marigold, and zinnia. Other than selecting plants that are immune to the disease, there is no effective cure for it. Remove the entire plant to prevent this disease from infecting other plants in your garden. The aster yellows phytoplasma organism will not survive once the plant dies. Learn more at Aster Yellows: What is it and what do I do about it?/The Garden Shed

ORNAMENTAL PLANT INSECT PESTS AND PREDATORS

It's a bug-eat-bug world out there and keeping insect populations under control is one of the gardener's biggest challenges in summer.

Red spider mites are a type of arachnid and not true insects. They may be tiny, but they can do a lot of damage. Pale, green coloration on foliage may be an indication of spider mite damage. Roses, evergreen species, and marigolds are examples of plants prone to their damage. To test for spider mites, hold a white sheet of paper underneath a leaf. Briskly tap the leaf to dislodge any suspected tiny, crawling red mites. If they are present on the leaf, they will drop onto the paper. A minor infestation can be remedied with a forceful, direct spray of water from a hose. Severely infested annual plants should be removed and destroyed.

Aphids are a common pest of many ornamental plants as well as houseplants, vegetables, fruit trees and field crops. These soft-bodied insects prefer succulent new shoots or young leaves. These pests have sucking mouth parts that allow them to suck juices from plant tissues. While a mild Aphid infestation is not

particularly harmful to a plant, a heavy infestation can stunt the growth of a shoot, cause slightly curled leaves, and delay the production of flowers and fruits. In addition, Aphids secrete a substance called honeydew, which encourages the growth of an unsightly sooty mold on foliage and interferes with photosynthesis. Fortunately, aphids have natural predators, such as lady beetles, parasitic wasps, lacewings, and damsel bugs, which help mitigate damage to plants. Also, a sharp spray of water is usually sufficient to dislodge them from plants. *Asclepias tuberosa* (milkweed), hibiscus, and Garden phlox are several plants that are often subject to aphid damage. A fascinating fact about aphids is that they are capable of reproducing parthenogenetically – that is, without mating. For more information on how that is possible and to learn about the relationship between aphids and ants, see Virginia Cooperative Extension publication ENTO-350NP on Aphids.

Not all bugs are pests. **Ground Beetles,** for example, are the unsung heroes in the battle against garden insect pests. Of this huge family of insects, approximately 2,500 species may be found throughout the United States. Most ground beetles have shiny, sometimes iridescent, black, blue-black, brown, or green hard shells on flattened bodies with narrow heads. They are equipped with large mandibles that they use to capture their prey. These nocturnal creatures feed at night and hide during the day under mulch, leaves, rocks, boards, or logs. They have wings but seldom fly, opting instead to scamper quickly away when disturbed. Both the adult and larval forms of ground beetles have voracious appetites and prey on a variety of soil dwelling pests as well as plant and tree pests.

Earwigs are considered to be either beneficial insects or pests or both, depending on your point of view. Anatomically, they are one of the stranger-looking insects in the garden. Large pinchers emerge from the tips of their abdomens giving them a ferocious look. Mostly nocturnal creatures, they feed on plants at night and hide during the day in moist, dark places, such as mulch, soil, plant debris and under rocks and boards. They are regarded as a nuisance because they feed on the flowers and foliage of a wide range of plants, leaving irregular holes or ragged edges. Despite their destructive eating habits, earwigs do have some useful qualities. They are omnivorous and help break down organic matter in compost piles. They are natural predators of aphids, mites, nematodes, insect larvae, slugs, snails, and other slow-moving insects. For more information, see VCE publication 3101-1527, Earwigs in Virginia.

Japanese honeysuckle seedling. Note the different types of leaves. Photo: Cathy Caldwell

INVASIVE ALERT: Japanese Honeysuckle (*Lonicera japonica*) is an aggressive, fast-growing vine that is invasive throughout the entire eastern United states. It forms large tangles that smother and kill other vegetation. Often found at the edge of a disturbance, such as a path or along the edge of woods, it prefers full sun but is highly adaptable and can thrive in shaded environments as well. It drops its leaves in colder climates but can be semi-evergreen to evergreen in warmer climates. It reproduces by seed or from runners. For advice on when and how to control this invasive species, see the Invasive Plant Control Calendar, which was published in the May 2022 issue of *The Garden Shed*. Also see the Blue Ridge Partnership for Regional Invasive Species Management (PRISM) fact sheet for information on Japanese Honeysuckle.

If you have a stiltgrass problem, now is the time to start keeping an eye on it, so you can treat it BEFORE it sets seed. Learn more at Weed Alert/Blue Ridge Prism/Act Now on Japanese Stiltgrass.

Japanese stiltgrass Photo: Susan Martin

Featured Photo: Cathy Caldwell

SOURCES:

Monthly Gardening Tips/July/Piedmont Master Gardeners

Deer Skew Jack-in-the-Pulpit Sex Ratios

By Cathy Caldwell | July 2023-Vol.9, No.7

Editor's Note: We are delighted to be able to share with you this article — about how deer overpopulation is impacting a plant that is rarely browsed. — by the notable plant expert, Matt Candeias, Ph.D. The article originally appeared in his internationally-recognized podcast and blog, In Defense of Plants. You'll want to check out his weekly podcast and his book, *In Defense of Plants: An Exploration into the Wonder of Plants* (2021)

Deer populations in North America are higher than they have been at any point in history. Their explosion in numbers not only leads to serious health issues like starvation and chronic wasting disease, it has also had serious impacts on regional plant diversity. Wherever hungry herds of deer go, plants disappear from the landscape. However, the impacts of deer on plants aren't limited to species they can eat. Research on Jack-in-the-Pulpit (*Arisaema triphyllum*) has shown that deer can have plenty of surprising indirect impacts on plants as well.

Though I wouldn't put anything past a hungry deer, plants like Jack-in-the-Pulpit aren't usually on the menu for these ungulates. Their leaves, stems, and flowers are chock full of raphide crystals that will burn the mouths and esophagus of most herbivores. Still, this doesn't mean deer aren't impacting these plants in other ways. Because deer are congregating in high abundance in our ever-shrinking natural spaces, they are having serious impacts on local growing conditions. **Wherever deer herds are at high numbers, forests are experiencing soil compaction, soil erosion, and a disappearance of soil leaf litter** (**also due in part to invasive earthworms**). Thanks to issues like these, plants like Jack-in-the-Pulpit are undergoing some serious changes.

Like many aroids, sex expression in the genus *Arisaema* is fluid and relies on energy stores. Smaller plants store less energy and tend to only produce male flowers when they bloom. Pollen, after all, is cheap compared to eggs and fruit. Only when a plant has stored enough energy over the years will it begin to produce female flowers in addition to males and only the largest, most robust plants will switch over entirely to female flowers. As you can imagine, the ability of a plant to acquire and store enough energy is dependent on the quality of the habitat in which it grows. This is where deer enter into the equation.

High densities of deer inevitably cause serious declines in habitat quality of plants like Jack-in-the-Pulpit. As leaf litter disappears and soil compaction grows more severe, individual plants have a much harder time storing enough energy each growing season. In places where deer impacts are heaviest, the sex ratios of Jack-in-the-Pulpit populations begin to skew heavily towards males because individual plants must grow much longer before they can store enough energy to produce female flowers. It doesn't end their either. Not only does it take longer for a plant to begin producing female flowers, individual plants must also reach a

much larger size in order to produce female flowers than in areas with fewer deer.

Photo by Charles de Mille-Isles licensed under CC BY-ND 2.0.

As mentioned, seed production takes a lot of energy and any plant that is able to produce viable fruits will have less energy stores going into the next season. This means that even if a plant is able to produce female flowers and successfully set seed, they will have burned through so much energy that they will likely revert right back to producing only male flowers the following year, further skewing the sex ratios of any given population towards males. Interestingly, this often results in more individuals being produced via clonal offshoots. The more clones there are in a population, the less diverse the gene pool of that population becomes.

Without actually eating the plants, deer are having serious impacts on Jack-in-the-Pulpit population dynamics. I am certain that this species isn't alone either. At least Jack-in-the-Pulpit is somewhat flexible in its reproductive behaviors. Other plants aren't so lucky. I realize deer are a hot button issue but there is no getting around the fact that our mismanagement of their natural predators, habitat, and numbers are having serious and detrimental impacts on wild spaces and all the species they support.

Further Reading: "Deer Indirectly Alter the Reproductive Strategy and Operational Sex Ratio of an Unpalatable Forest Perennial," *The American Naturalist,* Vol. 195, No. 1 (Jan. 2020)

Featured Photo: Jack-in-the-Pulpit (*Arisaema triphyllum*) by Michael Janke, CC BY-NC-ND 2.0