August 2023-Vol.9,No.8

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August in the Edible Garden

By Ralph Morini | August 2023-Vol.9,No.8

August is busy in the edible garden as we enjoy harvesting summer vegetables while making new plantings of fall crops. As noted in Virginia's *Home Vegetable Garden Planting Guide*, August is harvest time for beans, cucumbers, eggplant, melons, okra, onions, peppers, potatoes, squash, corn and tomatoes. At the same time, we can plant beets, broccoli, brussels sprouts, cabbage, carrots, cauliflower, many greens, lettuce, radishes, rutabaga, squash and turnips. When planting, remember that in the Piedmont's Hardiness Zone 7a, our average first frost is October 15 to 25. Consider the time until harvest, and plant early enough to minimize frost damage risk.

Carolina Wren on guard. Photo: R Morini

Summer Crops

Watering, hygiene, and harvest timing are key to extending yields on summer vegetables. The *1 inch of water per week* rule is a good guide. Be more generous when it is really hot and dry. Insert a finger in the soil a couple of inches to test moisture if in doubt. Removing diseased and damaged vegetation from the garden and keeping garden tools disinfected is also essential. Since a plant's job is done when it has created viable seed, pick vegetables before they reach full maturity to keep plants producing.

August is the peak of tomato season. Depending on variety and planting timing, determinate varieties may be presenting a full harvest now. Indeterminate plants can be kept productive until frost with good care. Pull off suckers, trim diseased leaves with disinfected tools, give a small fertilization boost if you haven't amended the soil since planting, and keep them well watered.

If your tomato plants have yellow, spotted, or brown patches on leaves, they may have nutritional deficiencies or one of a variety of diseases. General advice is to remove discolored leaves with a disinfected shears, then bag, and trash the diseased foliage. For help in identifying and treating possible causes, check out *The Garden Shed* article Tomato Diseases.

If the fruits are slow to ripen, the article Why Aren't My Tomatoes Ripening, from the Cornell Extension, explains why. At temperatures above 85° the plants don't produce the lycopene and carotene compounds

that cause the reddish color. We can influence ripening by picking tomatoes when the first blush of color change occurs, storing them at 70-75° in a dark, enclosed environment (I use a paper bag), and maybe adding other fruit, like bananas, to generate the ethylene gas that causes ripening to happen. The taste compromise is minimal compared to vine-ripened fruits. This is also a good way to protect tomatoes from invading varmints and to save late-season fruits that are threatened by frost.

If fruit damage is the issue, get help from the article Tomato Fruit Problems from the Missouri Botanical Garden.

Record identified problems in your journal so that next spring you can look for seeds or transplants that are resistant to the diseases identified, and note care advice that can help with nutritional or moisture-related issues.

Braconid wasp cocoons on hornworm. Photo: R Morini

Pests can also hurt your tomato harvest. Tomato hornworms are a common one. The key sign of their presence is denuded leaf stems. Pick and squish if you find a clean caterpillar. If it looks like the hornworm in the photo, leave it alone. The white cylinders on its back are beneficial braconid wasp cocoons. The adult wasp injects eggs into the hornworm. Larva feed on the worm's innards until ready to pupate, and then they exit and spin cocoons as shown. Tiny adult wasps emerge a short time later. The hornworm may live through the wasp cycle but will die before pupating.

A variety of other pests can attack our gardens in August. *The Garden Shed* article Eleven Common Garden Pests: Identification and Management can help identify specific pests and treatments.

Healthy Kale Crop. Photo: R Morini

Building a diverse ecology in the yard and garden is step one for creating a natural pest control system. I've been working over the past few years to add pollinator plantings, end chemical use, rotate crops, interplant, etc. For the second year now, the damage done by Japanese beetles and cabbage worms, previously extensive, has been dramatically lower. I attribute this to larger beneficial insect and bird populations on the property which contains numerous native trees, including "keystone" white oak trees. Increasing biodiversity definitely makes sense.

In any case, we're enjoying great bean and green crops with minimal effort and no chemicals.

More Gardening Tips and Tasks for August:

- When **choosing vegetables for the fall garden**, check seed packets or catalog, and select **semi-hardy varieties** that will tolerate a light frost and require fewest days to harvest.
- **Fall plants often have fewer insect problems** because they avoid the peak insect activity of midsummer. However, some insects, such as cabbage worms and corn earworms, may be worse later in the year than in the summer. Avoid some pests and diseases by rotating crop families to different bed areas than those where they were planted in the spring.

Spring compost batch at 4 months. Photo: R Morini

- When planting fall crops, **prepare the soil by restoring the nutrients removed by spring and summer crops**. A well-tended spring compost batch should be ready to be screened and spread on beds with a light application of a balanced organic fertilizer to replenish soil for fall crops.
- Dry soil can make working the soil difficult and inhibit seed germination. **Plant fall vegetables when the soil is moist,** either after a rain or after you've watered the area the day before planting. **Plant the seeds slightly deeper** than recommended for spring planting. Once planted, water them thoroughly.
- **Watering properly** is the key to conserving water and maintaining plant health in the heat of the late summer. One inch per week applied at one time will wet the soil 6 to 8 inches deep and ensure good yield from mature crops. Two inches of organic mulch such as leaves or straw will cool the soil and reduce surface evaporation. Water the garden early in the day so the foliage dries before nightfall. **Wet foliage at night increases susceptibility to fungal diseases.**

Cabbage worms on kale. Photo: R Morini

- If you have a problem with **cabbage worms** on your cole crops (cabbage, kale, collards, broccoli, cauliflower, brussels sprouts), consider using floating or hoop-supported row covers. Pick worms off the plants when you see evidence of chewing or excrement on the plants. For extreme infestations, use Bacillus Thuringiensis (Bt), a relatively safe organic pesticide as per label directions. If you protect your plants until the first frost, you can enjoy harvesting many of these vegetables well into winter. For more detailed info on the problem and solutions, refer to *The Garden Shed* article OMG, What's Eating the Broccoli.
- If **vining crops** like squash and pumpkins are taking up too much of your garden space, it's ok to pinch off the growing tips. This causes the plant to put more energy into fruit maturity, less into vegetative growth.
- **Harvest potatoes** when the vines turn completely brown. Brush dirt off tubers when harvesting and don't wash until just before use. Cure for a couple of weeks in a cool, dark place to allow skins to harden. If tubers are damaged when harvesting, use them immediately since they tend to spoil quickly. Also, cut away any green parts of potatoes since they are bitter and can cause gastric distress if a large amount is eaten. More info is available from the article Homegrown Potatoes Tell You When to Harvest Them by the Michigan State Extension.
- If you have never investigated **corn pollination** (hint: every tassel has to be pollinated by at least one pollen grain to create a fully kernelled ear), find an interesting explanation in the article The Corn Pollination Process from the Wayne County OSU Extension.
- **Bulbing onions should** be harvested when half their leaves are dried and fall to the ground. Harvest when soil is dry to minimize disease susceptibility. Allow them to cure for a few days. Remove dirt, cut off tops within 1-3" of the bulb, trim the roots, and leave the outer skin in place. Store them in a cool dry place.

- Garden vegetables that become over-ripe are easy targets for some pests. **Remove ripe vegetables promptly.**
- When harvesting, **don't let your produce sit in the hot sun**. Cover, or even better, keep them cool, to prevent wilting, loss of succulence, and conversion of natural sugars to starch.

Hang in There

It's easy for gardeners to slack off in August. Spring plants have expired, we've been fighting both pests and the weather all summer, and we're hot and tired. But if we stick it out, fall gardening can be really rewarding. Refresh the soil, plant the fall crops you enjoy the most, and you'll be able to have fresh garden produce well into, if not through, the winter.

Thanks for visiting us at *The Garden Shed*. I hope to talk again next month.

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Feature photo: Piedmont Master Gardeners Cleve and Fern Campbell's vegetable garden in August by R. Morini

August in the Ornamental Garden

By Cathy Caldwell | August 2023-Vol.9,No.8

August is a close second to July for being the hottest, muggiest month of the year in the Mid-Atlantic area. As much as we gardeners are tempted to take a break from our gardening chores this month, unfortunately, weeds, insects, and diseases don't take a vacation. In fact, our gardens need us more than ever this month to keep them looking lush and healthy.

Pay attention to the basic needs of the garden

- **Deadhead annuals and perennials such as zinnias, cosmos, garden phlox, or salvia** to improve the appearance of plants and encourage them to continue blooming. For *Echinacea*, *Gaillardia*, and other seed-bearing plants, **stop deadheading** at this point so that birds can eat the seeds this winter. Also, keep in mind that some dried flower heads on plants such as tall sedum, globe thistle, astilbe, and coneflower can look attractive throughout fall and winter.
- **Stake or cage perennials** that flop over due to heavy seedheads, weak stems, late summer storms, or other reasons.
- **Cut back** dried flower stalks all the way to the crown of the plant and remove any browned or yellowed foliage or tattered leaves (think hostas) that have been damaged by deer, rabbits or slugs.
- **Cut back and fertilize overgrown, leggy annuals** in beds, containers, and hanging baskets to produce another flush of growth before the plants succumb to frost this fall. **Do not fertilize perennials, trees, or shrubs at this time of year**. Late summer fertilizing produces tender new growth that will probably be damaged by cold weather.
- **Monitor moisture levels** and provide supplemental water to plants as needed. In general, 1" of water applied at the soil level per week is sufficient.
- **Do not prune shrubs or trees this late in the growing season**. Pruning now will stimulate

new growth which may not have time to harden off before winter sets in. So, unless you're removing a damaged or diseased limb or stem, hold off on pruning until late winter or early spring when the plant is dormant.

Don't let the weeds get out of control

While all our ornamental plants are gasping for water and respite from the heat, weeds perversely thrive under such stressful conditions. Every weed that produces seed this year means more weeds and more work for you next year. Some particularly prolific weeds include the following:

- **Common Ragweed** (*Ambrosia artemisiifolia*). This broad-leaf summer annual is the source of pollen that causes late-season allergies for many of us. Ragweed produces an amazing quantity of seeds in late August through September. One mature plant can bear between 30,000 and 62,000 seeds. Should any of the seeds become buried in the soil, they can remain viable for decades. See Virginia Tech's Weed ID website for photos and additional information on Common Ragweed.

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Spiny amaranth. Photo: John D. Byrd, Mississippi State University, Bugwood.org

Spiny Amaranth or Spiny Pigweed (*Amaranthus spinosus*). This summer annual is capable of producing about 235,000 seeds per mature plant according to the University of Tennessee Extension's fact sheet on Spiny Amaranth. Obviously prolific, this weed also has a taproot, which is difficult to pull when the soil is dry. Wearing gloves when pulling this weed is highly recommended due to the quarter-inch long spines at the base of the leaves.

- **Common Beggarticks** (*Bidens frondosa*). This weed sports small, golden-yellow blossoms in late summer through early fall followed by seeds that have two tiny barbs designed to latch onto animal fur and clothing. If you spot this weed in your garden, be sure to remove it before the seeds mature. Otherwise, you may never get rid of it. See the University of Missouri Weed ID website for several good photos of Common Beggarticks.

Stay alert for plant pests and diseases

Just as weeds appear to thrive in sweltering heat, insect pests and diseases don't seem to be impeded by it either. Stay on the alert for such problems as:

Hollyhock rust. Photo: Penn.State Dept. of Plant Pathology & Environmental Microbiology Archives, Penn State University. Bugwood.org

Rust – This fungal disease occurs when relative humidity is high and moisture stands on leaf surfaces for extended periods of time. Rust fungi produce masses of yellow, orange, brown, or rust-colored spores as part of their life cycle. Like powdery mildew, rust is an unsightly disease, but it rarely kills a plant outright. It will, however, stunt the plant and reduce its vigor. Rust is particularly common on ornamental plants such as asters, daylilies, dianthus, irises, hollyhocks, and phlox. For mild infections, remove infected leaves to contain the disease. The University of Massachusetts publication on Rust Diseases of Ornamental Crops is a good source for information on controlling this disease.

- **Black spot** – As its name suggests, this fungus appears as round black spots on the upper sides of rose foliage. The spots are often surrounded by yellow halos. As the disease progresses, the leaves turn yellow and fall from the plant. If you leave the leaves where they fall on the soil or mulch, the fungal spores will overwinter and infect next year's roses. To contain black spot, remove all fallen rose foliage and dispose of it in the trash. Do not put it in your compost pile. The Missouri Botanical Garden website provides a detailed explanation of black spot of rose and recommends several integrated pest management strategies for containing it.
- **Fall Webworms** – A widely distributed native pest of shade trees and shrubs, fall webworms appear in mid- to late summer through early fall. They skeletonize and consume leaves inside the protection of a tent-like silken web, which they spin over the foliage they are consuming. See Virginia Cooperative Extension Publication 2808-1013, Fall Webworm, for additional information on the life cycle of this pest and methods for its control.
- **Spider Mites** — These tiny pests can inflict serious damage to flowers, shrubs and both evergreen and deciduous trees during hot, dry weather. According to the Virginia Tech publication on spider mites, they use their needle-like mouthparts to pierce the leaves of host plants and suck out the fluids from individual plant cells. This results in a stippled or flecked appearance on leaves. It may be too late to eradicate spider mites this year but note their symptoms so that you can use safe and effective controls in the future.
- **Scale Insects** – Many species of armored (hard) and soft-bodied scale species are difficult to detect unless you know what to look for. These immobile insects use their piercing-sucking mouthparts to extract fluid, causing loss of vigor, yellowing of foliage, and branch dieback to a range of trees, shrubs, and other ornamental plants. At the newly hatched or juvenile stage, scale insects are called crawlers. Depending on the species, more than one generation may be born per growing season resulting in crawlers during May and June and then again in August

and September. Ladybugs, lacewings, and parasitic wasps are natural predators of scale insects. At the crawler stage, scale insects are also vulnerable to insecticides. VCE Publication 2808-1012, Scale Insects, provides additional information.

For more information on a variety of plant pest and disease treatments, see the Virginia Tech Home Grounds and Animals Pest Management Guide 2023.

Evaluate your perennials and annuals for heat and drought tolerance

Using plants that are naturally heat and drought tolerant help keep the late summer garden looking fresh and inviting. The following characteristics generally indicate good drought tolerance in plants:

- **Gray or silver-hued foliage** — The silvery color helps cool the plant and reduce water loss through transpiration.
- **Fuzzy or woolly-looking foliage** – The leaves of many gray or silver-leaved plants may also be covered with tiny hairs, giving the plant a fuzzy, woolly, or hairy look. The hairs reflect solar radiation, which helps to cool the leaf surface. In addition to slowing evaporation, they also capture moisture on the leaf surface and help offset the effects of drying winds.

Threadleaf coreopsis (Coreopsis verticillata). Photo courtesy of Missouri Botanical Garden Plantfinder.

Small Leaves – Many drought-tolerant plants have fine or lace-like foliage. The smaller leaf surface area offsets the loss of water through the leaves.

- **Thick, fleshy leaves** – The cells within the thick, fleshy leaves of some plants, particularly succulents, evolved to store water as a survival strategy during periods of sparse or no rainfall. Many of these plants are also able to store water in their stems and roots.
- **Waxy-coated leaves** – All plants have a thin waxy coating called a cuticle on their leaves, but those plants that have evolved with a thicker waxy coating are better equipped to retain water by limiting transpiration.
- **Taproots** – Plants with long taproots rather than fibrous roots are able to penetrate well below the surface of the soil in search of water.

Another important strategy is to use plant species that are native to central Virginia. These species have evolved using a variety of strategies for coping with the environmental conditions specific to this

geographical area. Check out this list of Native Drought-Resistant Plants for the Charlottesville area.

Watch for signs of drought stress in woody ornamental plants

Lack of water affects plants in various ways, depending on the species of plant and the level of stress to which they are subjected. In addition to wilting, which is frequently the first sign of drought stress, look for the following signs:

- **Premature fall color on trees** – This indicates that the leaves have stopped producing chlorophyll and is a signal that the tree may be in trouble. Drought stress may be the problem but not necessarily. Repeated defoliation by Japanese beetles or other insects, for example, can stress a tree. Also, the problem could be caused by damage from weed eaters and lawn mowers or from lack of oxygen at the root level if the tree was planted too deeply. Some detective work may be required to properly diagnose the problem.
- **Leaf Scorch** – This condition appears as a browning of leaf margins and tips. It is commonly observed on deciduous trees, such as maples, oaks, lindens, horse chestnuts, dogwoods and Japanese maples, and on broad-leaved evergreen plants such as magnolias, rhododendrons, hollies, and Japanese Andromeda (*Pieris japonica*). Leaf scorch may be the result of a combination of factors, including high temperatures, drying winds, and low soil moisture.
- **Shedding of leaves** – In an effort to conserve water, some trees sacrifice their older leaves in order to divert moisture to new growth and buds.
- **Shoot dieback** – Drought may make some woody plants (trees and shrubs) more susceptible to canker diseases. These are localized fungal infections that can cause the dieback of twigs and branches. Typically, a canker appears on a tree branch or twig as a sunken, slightly discolored lesion. Prune the twig or branch several inches behind the lesion. Do not cut into the lesion. Otherwise, you may renew or spread the fungal activity. Sterilize pruners after each cut using rubbing alcohol or a 10% bleach solution.

A drought this year may affect the health and vigor of next year's plants. Water-stressed shrubs that are forming flower buds for next year's display may produce fewer buds and smaller leaves. Fruiting shrubs, such as winterberries, may drop their berries.

Also, pay attention to evergreen species. Although water stressed, they often do not provide any clues to their condition and may stay green until it's too late.

Be alert to invasive species

Japanese stiltgrass (*Microstegium vimineum*) is an annual invasive that germinates a couple of weeks before crabgrass and flowers beginning in July into October. A single mature plant can produce about 1,000 seeds. The seeds ripen and drop to the ground between August and December and can remain viable in the soil for up to 7 years. Mowing and weed whacking it in August greatly reduces seed formation. For more information on this invasive species and how to control it, see the Blue Ridge Partnership for Regional Invasive Species Management (PRISM) fact sheet on Japanese Stiltgrass and the Invasive Plant Control Calendar in the May 2022 issue of *The Garden Shed*.

Plan ahead

Fall is the best time to divide spring or early summer-blooming plants. **Make a list now of perennials to move or divide this fall** and decide where to plant the new divisions. A little planning now will save you lots of time later when you get ready to perform this task. Plan to finish dividing plants about 6 to 8 weeks before the first hard freeze so that the roots have plenty of time to recover before the onset of winter

weather.

In addition to perennials, **anticipate planting trees and shrubs later this month or in early fall** so that they have time to settle in before winter. Prepare the hole in advance so that the plant can be transferred from its container and into its permanent home as quickly as possible. Water immediately and monitor closely while the plant is getting established. Plan on watering until the soil freezes this winter.

Sow seeds in late summer for cool-weather annuals such as calendulas, Iceland poppies, primrose, pansies, violas, snapdragons, stock, or forget-me-nots. Next spring, you'll be glad you planned ahead and sowed the seeds now.

Order spring-flowering bulbs now while selections are good. If you're buying bulbs directly from garden centers or nurseries, choose the largest bulbs available. Be wary of so-called "bargain" bulbs. If the bulbs are small or of inferior quality, they may not be much of a bargain.

SOURCES:Featured Photo: Rudbeckia 'American Gold Rush' and 'Color Guard' yucca. Photo: Pat ChadwickMonthly Gardening Tips/Piedmont Master Gardeners

Autumn Olive

By Cathy Caldwell | August 2023-Vol.9,No.8

Most Virginia gardeners are familiar with the highly-invasive autumn olive (*Elaeagnus umbellata),* a fast-growing deciduous shrub that can get quite large — up to 20 feet tall and 30 feet wide. It is native to eastern Asia and was introduced to the United States in 1830. Unfortunately, autumn olive was planted for erosion control, mine reclamation — and even landscaping — beginning in the 1950's. Eventually, its ability to form a shrub layer so dense that it displaces native plants and overtakes open woodlands, old agricultural fields, forest edges, and roadsides became abundantly clear. How does it do this? Autumn olive has a number of traits that give it major advantages over other plants: (1) it produces a large seed bank which is spread by the birds who eat its berries, (2) it is highly tolerant of salinity, extreme pH, and heavy metals, (3) it has the ability "to create its own absorbable form of nitrogen, altering the local nitrogen cycle to which native plant communities are adapted." Penn State Extension/Autumn Olive.

Autumn olive is now recognized as invasive in much of North America (but it's apparently not a problem in the arid West). Autumn olive is identified as an **invasive species** by the Va. Cooperative Extension, and is labeled as **highly invasive** by the Virginia Dept. of Conservation and Recreation. A plant acquires the "highly invasive" label when it spreads easily, alters ecosystem processes, and can cause substantial impacts on undisturbed natural plant communities. Virginia is far from alone in this regard; a number of states, including Tennessee and Kentucky treat autumn olive as a "severe threat" — due to its ability to spread easily and displace native vegetation. It is identified as an invasive by most states in the eastern half of the U.S. as well as by numerous national organizations, including the USDA's National Invasive Species list.

Autumn olive colonizing a field near a forest edge. Photo: Cathy Caldwell

As it spreads, autumn olive creates a shrub layer so dense that it prevents the growth of other plants. The fact that it can transform large areas into a monoculture is a major concern. Autumn olive has been busily transforming a large field between my family's back yard and the forested area that borders our property. Our field is Exhibit A on the impact of autumn olive; no dogwoods, redbuds or other desirable plants have been able to worm their way into the bulwark of autumn olives in our field. I now spend a goodly (badly?) portion of my time fighting it.

Recently, I've noticed a few new sprouts growing from a dead plant I thought I had already eradicated. I began to wonder if I was applying the "cut-stump" method correctly. Soon it occurred to me that expert guidance on this subject might be welcomed not only by me, but by the many others dealing with this shrub. I contacted the Blue Ridge PRISM and was delighted that one of their expert trainers — Tim Maywalt — was willing to demonstrate exactly how to deal with autumn olive. And we are all doubly fortunate that Tim's demonstration was turned into an educational video by Angela Orebaugh, a fellow Master Gardener who is also an expert videographer. The video — Controlling Invasives: Autumn Olive — is attached here and also below. I believe it will be helpful to all who are fighting this invasive.

This video provides comprehensive guidance on how to control autumn olive, showing you exactly how to proceed with each method available, from mechanical to "cut-stump" to "basal bark" and everything in between. You'll also appreciate Tim's discussion of the advantages and disadvantages of the various approaches, which can help you make the best possible choice. It is well worth your time.

By the way, if you have had any dealings with the thicket-forming autumn olive, you'll probably be as gobsmacked as I was to discover that some recent research suggests that autumn olive may have some healing medical properties. See "Prospects for the use of Physiologically Active Compounds of umbellata," *International Journal of Life Sciences,* http://www.crdeepjournal.org/wp-content/uploads/2021/06/Vol-10-3-1-IJLS.pdf (2021). I discovered another surprising article about autumn olive titled Elaeagnus umbellata: A miraculous shrub with potent health-promoting benefits from Northwest Himalaya. I'm not making this up. The articles I looked at mostly come from countries where autumn olive is a native and apparently NOT invasive. We in North America must remain vigilant in restraining autumn olive, These articles did give me cause to wonder if autumn olive might have some saving grace after all — at least in areas where it is not invasive. But if autumn olive is to be grown for medical use, it will need to be carefully contained — especially if it's anywhere near North America — or my backyard!

SOURCES:

With deep gratitude to Tim Maywalt of Blue Ridge PRISM (Blue Ridge Partnership for Regional Invasive Species Management, Virginia's first Cooperative Weed Management Area and to Angela Orebaugh, Piedmont Master Gardener and UVA professor.

Controlling Invasives: Autumn Olive, a video jointly developed by Piedmont Master Gardeners, Blue Ridge PRISM, and Charlottesville Area Tree Stewards

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No-Till in the Home Garden: Why and How

By Ralph Morini | August 2023-Vol.9,No.8

Most of us have grown up believing that tilling is an essential annual garden task to bury weeds, loosen soil, and create a smooth, clean planting bed. We know now that the benefits are temporary. Tilling buries surface weeds but brings buried seeds to the surface where they can germinate. It loosens the soil temporarily but upsets the soil food web, destroys soil particle aggregation that affects air and water penetration and availability, and releases a lot of carbon into the atmosphere. After a couple of rains, the soil re-compacts and erosion issues return. Finally, unless organic matter (OM) is added to the soil, growers tend to rely on chemical fertilizers, insecticides, and herbicides to feed and protect plants. The combination of runoff and chemicals is a well-documented cause of pollution of surface water and waterways like Chesapeake Bay and is a major cause of pollinator death.

No-Till, when well-managed, has a more positive impact on soil health. It is part of a set of practices that are advocated by The Virginia Soil Coalition (4thesoil.org) that includes:

- Keep the soil covered
- Minimize disturbance
- Maximize living roots in the soil!
- Energize with diversity.

No-till is a central element of this natural soil improvement philosophy. When combined with related regenerative practices, it covers and protects the soil year-round, doesn't disrupt soil life or structure, reduces compaction, and doesn't bring weed seeds to the surface. No-Till works with cover cropping, mulching, interplanting and crop rotation to achieve the goals of the *4theSoil* movement mentioned above.

So, how can a home gardener convert from tillage to no-till?

Start in the fall

Going no-till and building healthy soil naturally is a long-term commitment, not an instant fix. It makes

sense to start the conversion in the fall when the beds' growing seasons are completed.

A soil test is a great way to start. If an addition of organic matter (OM) or a pH adjustment is needed, or if serious weeds or roots need to be removed, a single tillage can make sense to speed up the desired soil change.

A winter cover crop is the top choice for soil protection over the winter. Cover crops can be planted from mid-August to mid-October in our area, but as winter gets closer, the choice of cover crop narrows as the time available for it to establish prior to winter, diminishes. **Winter-hardy** cover crops may go dormant but survive winter and restart growth in the spring. **Winter-kill cover** crops are killed by winter freezes, and their killed vegetation forms a mulch layer on the garden bed. It can be left in place or composted in spring. Guidance for cover crop selection is offered in the article Improve Vegetable Garden Soil with Cover Crops from the Penn State Extension.

If harvest is too late to establish a cover crop, provide winter soil protection by covering the beds with an organic mulch like straw, or chopped leaves. Extension experts suggest up to 6 inches of mulch to maximize effectiveness. Mulching doesn't add roots to the soil like cover crops, but it provides soil protection and adds organic matter that will increase soil health over time, making it a good second choice. It also enables early spring planting without having to wait for a winter-hardy cover crop to flower.

Another option, especially for new beds, is ***sheet mulching***. Sheet mulching requires laying out beds, moistening the soil, covering the bed areas with overlapping newspaper or cardboard, and adding 6 or more inches of a mix of organic material (soil, compost, wood chips, straw) and letting it decompose until spring when it can be planted into directly.

Sheet mulched bed at UAC CATEC Garden. Photo: R Morini

The bed in the photo above was sheet-mulched with partly decomposed arborist waste in fall and was planted the following spring. As the photo shows, it produced a healthy crop of brassicas and greens.

CATEC winter cover crop, flowering. Photo: R Morini

Cover crop cut close to the ground after flowering. Photo: R Morini

Spring Prep

Cover crop vegetation, if *winter-killed*, can be left on the soil in spring as a mulch or composted. If *winter-hardy*, the best practice is to let crops grow until they have flowered, then cut them close to the ground prior

to seed formation (see photos). The plants are weakened at that time and less regrowth occurs. Cuttings can be left as mulch or composted. Planting can usually happen conveniently a couple of weeks after cutting, when roots and crowns soften. If cut before flowering, they may regrow. If so, covering with plastic for a month or more or mechanical removal may be needed to prevent regrowth. Another option is to cut planting rows into the cover crop crowns while allowing the cover to regrow alongside the edible crops.

The diverse cover crop above includes crimson clover, forage radish, and winter rye. The radish was winter killed, and the clover and rye were cut close to the soil with a string trimmer when the crimson clover flowered, prior to seed generation, in April. Regrowth was minimal. Sweet potato slips were planted in raised rows and the space was mulched with 6” of straw that minimized weed growth while generating a nice sweet potato crop (photo below).

Mulched sweet potato planting in CATEC cover cropped plot. Photo: R Morini

While mulching gives up some of the benefits of cover cropping, it enables planting in early spring, prior to cover crop maturity. Cover crops provide other benefits including building strong roots to loosen soil while depositing the products of photosynthesis. Rotating crops year to year allows rotating cover crops and mulch, spreading their varied benefits to different beds.

If there are compaction issues in the bed, loosen the soil with a broadfork or digging fork by driving the fork as deeply into the soil as possible and rocking it back and forth. This reduces compaction without crushing aggregates, disrupting soil life, or lifting buried weed seeds to the surface. If the bed is given a light (up to 2”) covering of compost prior to broadforking, the loosening will help compost penetrate below the surface. Also, building permanent beds and paths helps reduce compaction in the growing spaces while reducing the areas needing soil protection.

Planting

Cutting planting rows in trimmed living cover crop. Photo: Penn State Extension

If trimmed cover crops don't regrow, seeds and transplants can be planted directly. The photo above shows an agricultural field using a tractor to cut rows for planting while allowing the cover crop to regrow between crop rows. In home gardens we can use hand tools like stirrup hoes to create seed planting rows. Some who are fussy about smooth seed beds, might want to try shallowly-penetrating surface-loosening equipment such as a wheel hoe or tilther. These tools are expensive ($250 and up) but can create a nice seed bed without going deeply into the surface. If there is significant uncovered soil after surface loosening, it is advisable to cover open areas by interplanting, mulching or cover cropping as the main crops are growing.

Interplanted raised beds. Photo: Photo20220707-CSW-059 by USDAgov

Interplanting a mix of crops, closely spaced as the photo above shows, is a good way to add diversity to the soil. Also, close planting helps reduce heat impact and moisture loss in the soil below. The goal is to space plants so that their vegetative growth will shade the soil, reducing weeds and watering needs.

If the beds were mulched over winter the practices are similar, except that no crop termination is needed. Move mulch to create rows or planting spaces, then replace it around plants after seeds germinate and plants are tall enough to catch the sun above the mulch.

If the bed was sheet-mulched, seeds and transplants can be planted directly, and interplanted or mulched when the plants are tall enough to stand above it.

In the end, the goal is to keep the soil covered year-round to minimize erosion and runoff, and to manage weeds and moisture while regularly adding sources of organic matter to the growing beds.

Beds idled in summer after spring crop harvest

Summer buckwheat cover crop ready for cutting at UAC CATEC garden. Photo: R Morini

After spring crops are harvested, usually by the end of July, and if another edible crop is planted right away, follow the spring planting guidance. Vegetation from the harvested plants should be disposed of if diseased but can be chopped for use as mulch or composted if healthy. If the space is not immediately replanted, consider either mulching or a short-term cover crop, like buckwheat. Buckwheat flowers after about 6 weeks, draws pollinators to the garden, and can provide a green mulch or compost additive when cut. After cutting, the space becomes available for a fall edible or cover crop planting.

After fall harvest, the cycle repeats

When the growing season is completed, protect the soil over the coming winter. Space available for cover cropping in September can benefit from a diverse, winter-hardy cover crop. Space available later in the fall, up to late October in Zone 7A, can benefit from a winter-kill crop like Oats, that grows fast, and after frost-killing, creates a mulch layer that will provide winter soil protection. It provides many of the benefits of a winter-hardy crop and allows early planting in spring.

Oats interplanted in a raised bed. Photo: Ron Trexler, UNH Extension Master Gardener

Summary

Following No-Till along with the other regenerative practices noted above is a positive soil and environmental practice:

- **Keeps the soil covered** with garden crops, mulch, cover crops, or tarps.
- **Minimizes soil disturbance** and compaction by permanently separating paths and beds and loosening soil with a digging fork or shallow surface-loosening equipment rather than deeper penetration with a tiller or shovel.
- **Maximizes living roots** in the soil by rotating and interplanting crops and using diverse cover crops among or in place of garden crops, during and between growing use.
- **Energizes soil with diversity** by increasing the mix, density, and location of mulches, edible crops, and cover crops.

While the percentage of US farmers, growers, and home gardeners that use No-Till practices is small, it is growing. The data that supports no-till is strong. While the deep tilling and chemical fertilization practices of the last 100+ years helped feed a fast-growing population, its negative effects on soil and the environment call for changes like those discussed above, sooner rather than later. I hope the suggested techniques are clear, simple, and motivating enough to justify making the change. It is important for the soil and the planet.

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Starting Milkweed From Seed

By Deborah Harriman | August 2023-Vol.9,No.8

You may be familiar with the amazing story of a monarch butterfly's life. The adult butterfly spends the winter high in the oyamel fir forests of Mexico and then starts her annual migration north in the spring. She stops along the way to lay eggs that will develop into the next generation of butterflies. Each generation flies north until finally the fifth and final generation starts its flight south to return to Mexico. There, the monarch butterfly will over-winter with other monarchs until it is time to start the migration again.

The host plant for monarchs is milkweed: monarchs will only lay eggs on milkweed plants, and monarch larvae (the caterpillars) will eat only the leaves of milkweed plants. Unfortunately, development and pesticide use have destroyed habitats and reduced the milkweed supply, nearly decimating the population of this beautiful creature. Piedmont Master Gardeners have explored these topics in two recent articles:

https://pmgarchives.com/monarch-butterflies-are-at-risk-you-can-help-protect-them/

https://pmgarchives.com/the-importance-of-milkweed-to-monarchs/

Master Gardeners' Milkweed Seed-Growing Project

People are increasingly concerned about the plight of monarchs, so organizations and individuals have planted milkweed patches to create Monarch Waystations that will sustain monarchs on their long journey. However, milkweed plants can be hard to find, and local nurseries have limited supplies. This led a small group of Piedmont Master Gardeners to aid this effort. Our group grew milkweed from seed to offer to the public at our Spring Plant Sale. This article describes several seed-starting methods and shares tips for those who want to try growing their own milkweed plants.

IDENTIFY PLANTS

According to the Biota of North America Program (BONAP) milkweed plants most prevalent in the wild in the Central Virginia Piedmont region are common milkweed (*Asclepias syriaca)*, butterfly weed (*A. tuberosa)*, swamp milkweed (*A. incarnata)*, and whorled milkweed (*A. verticillata*). Taking the importance of locality one step further, growing plants of local ecotypes is considered a best practice. These are plants native to a region, that have adapted to that region over time. Their genetic make-up is more like other species in the same region than to the same plant from another region. marylandgrows.umd.edu/What are local ecotype plants and why do they matter to pollinators?

Trying to harvest milkweed seeds of the same local ecotype would mean collecting in the wild. That would be a difficult proposition if we wanted to control the process and provide lots of plants for sale. Some Master Gardeners did gather common milkweed seeds from the wild, but most seeds were collected in our own gardens. Common milkweed, butterfly weed, and swamp milkweed were the most available to us, so our project focused on those varieties.

DETER PESTS

Milkweed plants must escape being eaten by predators, if flowers and then seeds are to form. The sap contains toxins called cardiac glysosides or cardenolides, which make it poisonous to animals if eaten in large quantities. Despite its reputed unpalatability, deer and rabbits will munch on milkweed. In fact, deer ate every bloom on my butterfly weed this past spring. To deter mammal browsing, install physical barriers, such as fencing, or string several pieces of monofilament between stakes around the bed. For a less unsightly tactic, spray aromatic barriers or sprinkle deer deterrent pellets around the area. While both are effective, the key to using them is to apply them frequently and switch products regularly, because deer become accustomed to those odors and will eventually ignore them.

The milkweed bug (*Oncopetus fasciatus*) is a common pest on milkweed. The small bright orange nymphs cluster on the flowers when they bloom. The adults are large, bright orange bugs with black markings. Milkweed bugs are active for only a short time and not a danger to the plant. They feed on the seeds by piercing the milkweed pod with their long proboscis. Thus, these bugs are a problem if seeds are going to be collected.

Handpicking milkweed bugs off and dropping them into a jar of soapy water or applying insecticidal soap are effective controls. But killing them all removes them from the ecosystem, which is usually not desirable. For example, when milkweed bugs eat the seeds, that prevents milkweed from spreading and becoming too abundant. A better method is to preserve some of the seed pods for collection, while letting nature take its course with the others. Small pieces of netting or net bags can be tied around a few pods before the insects become active. The net bags commonly used as party or wedding favors are available in craft stores and online. Bags can be left on the pod, and seeds will continue to form until it's time to collect them.

Net bag protecting a developing seed pod. Photo credit: Anne Nelson

COLLECT AND STORE SEEDS

Milkweed seeds form inside pods attached to a mass of delicate floss known as coma. Once the pods open, the floss wafts in the air until the seeds land and eventually germinate. There is so much floss in each pod that it was historically used to stuff pillows and mattresses. Naturally buoyant and water-repellent, this floss was used to fill life jackets for soldiers in WWII.

The abundance of floss can make seed collection a challenge, but certain techniques can make this process easier. Late summer or early fall is the time to start collecting. Not all pods ripen at the same time, so look for pods that are mature and have started to turn brown. Look for those that are not yet split open. They may still be somewhat green.

When pods are ready, apply slight pressure at the seam to pop the pod. You will see seeds packed tightly in rows along the floss. If seeds are dark brown, they are ripe and ready to collect. If they are white or tan, they need to mature on the plant a little longer. When timing is right (before the floss expands), squeeze the pod until it pops, grab its narrow end, and pull out the whole rib. Rake your finger along the seeds, going with the grain of the seed to separate them from the floss, and put them put into a container. This video from Project Monarch Watch is a good tutorial: https://www.youtube.com/watch?v=aFXWitrxOmQ.

After the pods pop open naturally, wind will carry the floss with seeds attached, dispersing them to the ground. It's best to collect only some of the milkweed seeds from a plant, so the rest can spread on their own. To avoid mold, be sure the seeds are completely dry before storing them in envelopes, paper bags, plastic bags, or air-tight containers. Keep seeds in the refrigerator or another cool, dry area until planting time.

PLANT SEEDS

The PMG group used several methods (described below) to germinate seeds.

Outdoors in the Fall

In nature, seeds fall to the ground where soil, leaves, or snow slowly cover them. The long winter in a cold, moist environment softens their hard husk and breaks their dormancy, so they can germinate with rising spring temperatures. This process is called stratification. The laissez-faire gardener can mimic nature by scattering the collected seeds on a raked, weed-free area in the fall to let nature take its course. This previous article discusses a Master Gardener's experiences planting common milkweed outdoors in the fall. https://pmgarchives.com/article/milkweed-in-the-garden/

Milkweed is difficult to transplant once it is growing. Therefore, our group decided to try other methods to improve germination rates and provide plenty of milkweed plants for the public at the spring sale.

Indoors under Lights

For speedy germination and more control over the process, some Master Gardeners started milkweed seeds inside under lights. With this method, it's necessary to artificially create the cold stratification process. In early January, wrap the seeds in a single layer in damp (but not wet) paper towels, coffee filters, or in dampened vermiculite and place them in resealable plastic bags. A dry paper towel can be placed on the damp towel to absorb excess moisture. Store in the refrigerator (not freezer) for 30 days. Monitor seeds weekly to be sure the medium and seeds do not dry out.

After 30 days of stratification, plant the seeds in dampened seed starter mix in cell packs, small pots, peat pots, or seedling trays. Top with a dusting of vermiculite or chicken grit. Cover the trays with plastic domes and set under the grow lights. The pots or trays can also be placed on heat mats to speed germination. If used, remove those mats after seeds sprout. Water the pots from the bottom rather than from the top so the water seeps up to the roots. Keep the foliage moist by occasionally giving seedlings a spritz with a sprayer. Place the grow lights close to the seedlings, so they do not stretch toward the light and become weak. After seeds sprout, remove the plastic cover to allow good air flow. You can also use an oscillating fan to mimic outdoor breezes and promote stronger stems. Transplant the seedlings to larger pots as they grow. When the weather warms in March, "harden" off the seedlings by moving the pots outdoors during the day and back inside at night. After a few days, the pots can be kept outdoors, but move them into a porch or garage if freezing temperatures are forecast.

In a Sunny Window

No lights? No worries. Common milkweed is a reliable germinator. After the stratification process, one Master Gardener sowed the seeds in cell packs, sprinkled them with chicken grit, and placed them in a sunny, south-facing, window. She covered the seeds with a plastic dome and placed the pots on a heat mat. She watered from the bottom to keep soil moist and removed the mats and domes when seedlings appeared. When the weather warmed up, she moved the seedlings outside, following the hardening off process described above.

In Plastic Containers or Gallon Jugs

For a semi-controlled but less finicky process than using lights, some Master Gardeners sowed seeds in plastic containers and milk jugs. Seeds sown in the ground outdoors are at the mercy of Mother Nature. They can wash away, rot in wet soil, dry out, or be consumed by animals. Starting seeds outdoors in containers enables the moist, cold stratification process naturally, while protecting seeds from the vagaries of nature. Here is the step-by-step process.

Clear plastic produce boxes make ideal seed-starting containers. Good drainage is necessary, so if there are no holes, punch plenty in the tops and bottoms. Fill with about 4 inches of moist seed-starting mix or other potting mix. After sowing the seeds, cover with a dusting of vermiculite or coarse sand (do not use

playground sand because it is too fine), and close the lids. Place the containers outside in a sunny location away from wind. To ensure good drainage, place them on a table off the ground. They should be fine all winter, but check them periodically to see if they need water. If the area becomes shady when trees leaf out, move the containers to a sunny spot. After seeds germinate (mid to late March), remove the lids, put the containers in the sun, and water as needed. When there are several sets of true leaves, transplant the seedlings to larger pots.

Winter sowing in gallon jugs requires some preparation, but then you can "set it and forget it." Collect and wash a few one-gallon plastic milk or similar plastic jugs. Toss out the caps, since you will leave the jugs open to winter precipitation. Use a marker to delineate a cutting line around the jug, just below the handle. You can rest a marker on a coffee cup and turn the jug around to ensure the line is level all around it. Use a box cutter or sharp scissors to cut along this line, but don't cut the section under the handle because this will serve as a hinge. You now have a "pot" with a closable dome attached.

Photo credit: Deborah Harriman

Poke or drill plenty of holes in the bottom of the jug. If available, a drill is the easiest method. Place the bottom of the jug on a wooden board to give the drill some purchase as it spins. In mid-December or early January, fill the jug with damp (but not soggy) potting soil; this should be several inches from the top of the jug. Sprinkle the milkweed seeds over the soil and spread a thin layer of coarse sand, vermiculite, or chicken grit over the seeds. No further watering is needed. Close the dome and seal the cut with 2-3 layers of duct tape. The top, where the cap used to be, should remain open. Place sealed jugs in a sheltered spot to begin their long winter's nap.

If wind or marauding animals are a problem, place the jugs in milk crates, so they won't topple. If the jugs are under trees or in the shade, move them to a sunnier spot after trees start to leaf out in spring.

Photo Credit: Melissa King

These seeds will gradually undergo stratification and should sprout by mid to late March. This waiting period may test your patience, but have faith in the process. Observe regularly. When seeds begin to sprout, cut open the jugs and move them to a sunny spot. Water the open jugs as needed. When the seedlings have several sets of true leaves, transplant them into small cell packs or individual pots.

No matter which method you choose, seedlings can be transplanted into the garden when they have four sets of true leaves and are about 3 inches tall. Disturb the roots as little as possible during this process, especially common milkweed and butterfly weed, which develop long tap roots. You can plant seeds started in peat pots directly into the garden, but make sure the rim of the pot is not above the soil.

Milkweed should be planted in areas that meet its cultural needs: dry for common milkweed and butterfly weed, but moist for swamp milkweed. Remember that all varieties of milkweed need plenty of sun. It takes time for roots to develop, so don't be disappointed if milkweed plants don't bloom during their first year.

Photo Credit: Melissa King

SUMMARY

Our group of Master Gardeners discovered that starting milkweed seeds under lights indoors or winter sowing in containers outdoors are both effective methods. We successfully cultivated 400 milkweed plants to sell to the public. Using lights resulted in quicker germination and larger plants by early May, but winter sowing was easy and fun. Collecting, stratifying, and seeding was an excellent learning process, and we hope other gardeners will try it. Our collective efforts will help monarchs survive in the years to come.

Tips for starting milkweed seeds:

- Dry seeds before storing them.
- If starting inside, stratify seeds for at least 30 days (the paper towel should be damp, not wet).
- Use seed starting mix or other reliable soil-less potting mix.
- Starting mix should be damp, but not wet.
- Label pots with date and milkweed species; a permanent marker works well.
- Remove domes or open lids on containers when seeds geminate.
- Once seeds in pots germinate, water from the bottom (not from above).
- Thin seedlings in plastic containers or jugs to ensure good airflow and promote stronger root development.
- Seedlings started inside should be hardened off before being moved outside.

Featured Photo: Deborah Harriman

Resources

5 Steps to Planting Milkweed Seeds Indoors, (Save Our Monarchs)

Harvesting Milkweed Seed: A Pod and A Plan, (Xerces Society)

How to Collect and Grow Milkweeds to Help Monarchs and Other Pollinators, (Michigan State University Extension)

Milkweed Bugs, (Missouri Botanical Garden)

Milkweed FAQS, (Xerces Society)

Monarch Butterfly Habitat Needs (U.S. Forest Service)

Native Milkweed Germination Guide (Oklahoma State University)

Starting Seeds in Winter (Penn State Extension)

The Biota of North America Program (BONAP)

Why Milkweed (Monarch Joint Venture)

Upcoming Events

By Erin Hall | August 2023-Vol.9,No.8

Blue Ridge PRISM Summer Invasive Workshop

August 10 | 10:00 am – 1:00 pm | $25.00

Camille Trailhead | 721 Rockfish Valley Highway | Nellysford, VA 22958

Register via Eventbrite

An in-person workshop to guide you through invasive plant management in the spring and summer.

The Hospitable Gardener: Welcoming Fireflies and Other Creatures to Your Yard

August 11 @ 10:00 am – 11:30 am EDT

Are you charmed on summer evenings by the tiny bobbing lights of amorous fireflies? Many non-human creatures share the property we call our own, and we can improve the quality of their lives and support the environment by the way we garden. This talk by Extension Master Gardener and Master Naturalist Alyssa Ford Morel looks at fireflies, hummingbirds, lady bugs, and other creatures with whom we share our yards, and suggests practices to welcome and support them. You will learn ways to start addressing the biodiversity crisis at home.

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