January 2025-Vol.11,No.1

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The Edible Garden in January

By Ralph Morini | January 2025-Vol.11,No.1

With the holidays behind us, January is a great time to relax while starting to think about the upcoming gardening year. While we rest physically, we can think about how to improve our practices environmentally and horticulturally. Here are some ideas that can help move us in that direction:

Most gardeners know about the advisability of keeping a garden journal, but I suspect that many of us are careless about maintaining them. Keeping an accurate journal is a great New Year's resolution. Journals can include any and all information that can help build gardening success, including:

- A garden sketch to track specific crop locations, through spring, summer and fall plantings. Use the information to plan crop rotation to reduce pest and disease issues.
- Organizing companion planting and intercropping practices to build soil health and help reduce weed incursions. Note the dates when specific diseases and pests arrive and/or depart, on which plants, to let you know when to take action to manage damage.
- When investigating seed or plant purchases, look for varieties that resist the problem diseases and pests that you have identified.

Vegetable IPM Guide, Penn State Extension. Photo: R Morini

- Identify and record pests and ways to combat them. A good resource is the Penn State Extension publication *Vegetable Integrated Pest Management With an Emphasis on Biocontrol.*
- The new seed catalogs are out now, both online and hard copy. It is worth reviewing a few different providers to compare selection and prices while deciding what to plant in your precious garden space. Look for seed and plant varieties with good pest resistance. Maybe choose to grow something you've never grown before, which is a good learning experience, if not plain old fun. Review The Garden Shed article Using Seed Packet Information to Help the Garden Grow for help interpreting pest and disease resistance information.
- If you are thinking of adding small fruits to the garden, review the VCE publication Small Fruit in the Home Garden for helpful advice.
- Read and record best gardening practices. Study Integrated Pest Management (IPM) to reduce chemical use.
- Learn about regenerative gardening practices that focus on naturally building healthy soils as the basis for healthy, nutritious crops.
- Review ways to add pollinator habitat to your landscape to create a healthy insect population and use beneficial insects to help keep pests under control.

If you are looking for some reference books to advance your horticultural education, check out The Garden

Shed articles Books Every Gardener Should Have and New Gardening Books.

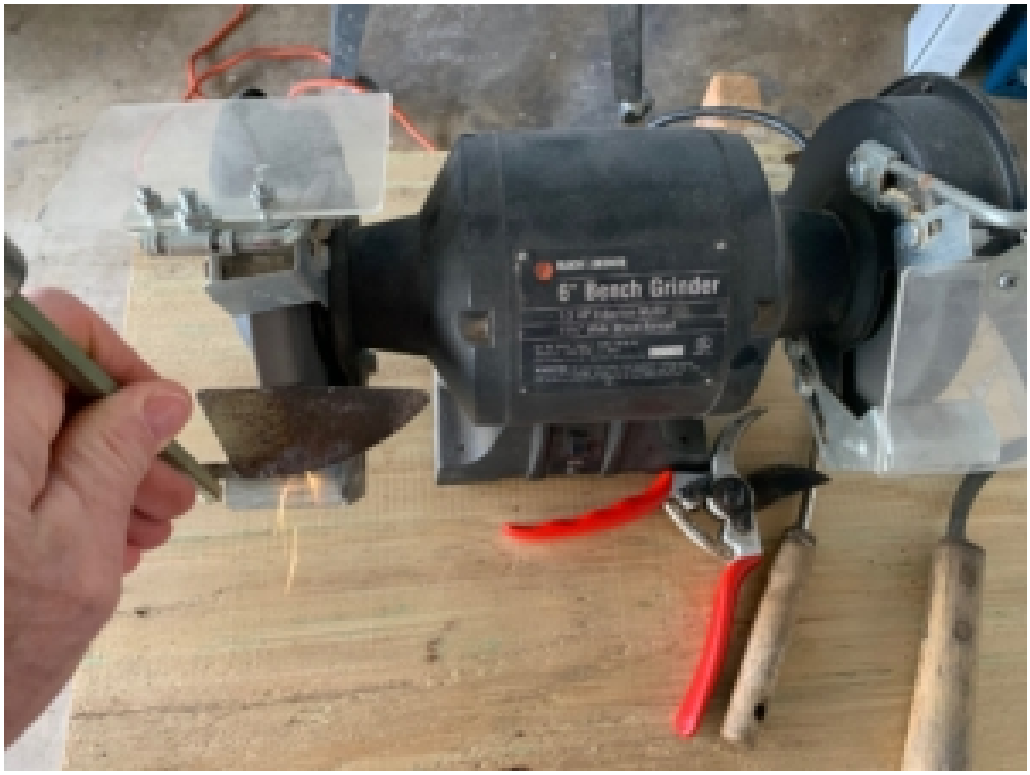
Learning and recording new skills over the winter and putting them into practice in the coming season is a great way to become a better and happier gardener.

Hands-on Tasks

- While decomposition slows down as temperatures drop below 50 degrees F, it is a good idea to collect materials over the winter to start new compost batches in the spring. Stock your pile or compost bin with leaves, preferably chopped. If you need more “brown” (carbon-rich) materials for your batch, save newspapers, boxes and household paper, not contaminated with plastic tape, coatings or cleaning fluids, tear them up and add them in. Add kitchen fruit and vegetable scraps to the pile during the winter and rotate the pile every once in a while. In the spring, when green materials like grass clippings are available, add them in to get to a volume ratio of two to three times as many browns as greens by volume, moisten everything so it is wet but not dripping, rotate it once or twice a week and you’ll have beautiful compost in time for planting summer vegetables in May. For detailed advice on home composting, review The Garden Shed article Backyard Composting with Practical Tips from the Pros.

Simple seed starting setup. Photo: R Morini

- If you want to begin starting seedlings indoors this winter now is the time to acquire equipment and plan the process. Check out The Garden Shed article Starting Seeds Indoors for detailed guidance from an experienced Master Gardener.
- If you have older seeds that may have outlived their viability, it makes sense to test their germination rate. The Garden Shed article Good Seeds, Bad Seeds explains how to test seeds prior to planting.



Sharpening garden tools. Photo: R Morini

- Winter is a good time to clean and sharpen garden and cutting tools. Scrub them, rinse them in a 10% bleach solution and wipe dry. Sharpen cutting edges and oil blades and pivot points to protect their edges and maintain free movement. If you have a warm enough place to do it, wash and disinfect pots and planters the same way. It is great to reach spring with tools and pots ready to go.
- If you end up with a stack of plastic pots that you don’t need, recycle them. Some local nurseries will take them for their own or community reuse. Lowes has a chain-wide recycling program. Let’s keep plastic out of landfills!

Papa bluebird delivering worm to hungry fledgling. Photo: R Morini

- A key to minimum chemical gardening is to create the most diverse eco-system you can in your yard and garden. Feeding the birds in winter is a good way to keep these helpful predators around for when they are needed. Get some tips on good bird feeder practice in The Garden Shed article Creating a Bird Friendly Garden.
- If you have a natural Christmas tree, please recycle it. Albemarle County has a recycling program with multiple drop off sites. They convert the trees to mulch that is offered free to residents.
- If you burn wood in your fireplace, and compost or add the ashes to the garden, remember that ashes are alkaline. They can be used as an amendment but will raise the soil pH if added in quantity. Not all plants can tolerate alkaline soils. Ornamentals including lilac, weigela, pinks and mock orange as well as vegetables including spinach, beets, corn and cabbage are exceptions. For more info, check The Garden Shed article Wood Ashes.
- If you really want to grow something, create an indoor herb garden. The Garden Shed article Be Inspired With Indoor Herb Gardening tells you how.
- Aphids, spider mites, whiteflies, and other pests are winter houseplant nemeses. To minimize pest damage, keep new plants separate from plants moved indoors, remove dead/damaged foliage and use soapy water and sticky-card fly traps around plants to repel and catch invaders. Detailed advice is found on the U of Minnesota Extension publication Managing Insects on Indoor Plants.

I hope that these activities will help you enjoy the winter break while increasing your gardening skills and preparedness for the coming outdoor gardening year. See you next month at The Garden Shed.

SOURCES:

Featured Photo: Snow on the Cover Crop, by R Morini

"Plants Grown in Containers," NC State Extension,

Climate Resilient Vegetable Varieties | Piedmont Master Gardeners, by John Traunfeld, U of MD Extension specialist (printed in January 2023 Garden Shed).

How to Create a Garden Journal | Piedmont Master Gardeners, from Jan 2023 Garden Shed, by Pat Chadwick.

Using Seed Packet Information to Help your Garden Grow | Piedmont Master Gardeners, from January 2018 by R Morini.

The Ornamental Garden in January

By Cathy Caldwell | January 2025-Vol.11,No.1

The coldest temperatures of the year in the Charlottesville/Albemarle County area of Virginia have generally occurred in January. Historically, this is also the driest month of the year. Pay attention this month to weather-related issues in the ornamental garden such as frost heaving or broken tree limbs. As you stroll through your property this month, take stock of the landscape without the distraction of foliage. Use this time to evaluate what changes, if any, you want to make. If you have landscaping projects in mind for this year, now is a good time to start planning for them.

Inspect recently-planted perennials and other landscape plants for signs of frost heaving, which is caused by alternate freezing and thawing cycles. Reposition any plants that have been pushed up out of the ground and make sure the roots are well covered with soil. Gently firm the soil around the roots and apply a layer of mulch to help protect them from freezing weather and drying winds.

Monitor trees, shrubs, and perennials that were planted this past fall to make sure they don’t dry out from lack of moisture. In the absence of adequate rain or snow, provide newly-planted trees with about one gallon of water per inch of trunk caliper (trunk diameter at 12” above the ground) per week during the dormant months (November through March). Spread the weekly watering over a 2- to 3-day period, if

possible. Water when the temperature is above 40°F and there is no snow or ice on the ground near the trees. Water early in the day so that the plants have time to absorb it before temperatures drop at night. As a rough guideline, use a hose to water newly planted shrubs approximately 10 seconds per gallon plant size. In other words, if the plant came in a 3-gallon container, water the root ball for about 30 seconds.

Gently brush accumulated heavy snow off evergreen shrub and tree branches to minimize breakage. Shaking the branches is **not** recommended. If using a broom to push the snow off, use an upward rather than a downward motion. For plants coated in ice, allow the ice to melt on its own. Otherwise, attempts to force ice off the branches may damage the plant.

Prune tree and shrub branches that have been obviously broken down by snow or ice. For more information on this and other winter-related hazards, see Virginia Cooperative Extension Publication 426-500, Managing Winter Injury to Trees and Shrubs.

Inspect tree trunks and shrubs periodically for animal damage. Winter damage to woody plants from deer browsing and antler rubbing is common throughout the area. Small animals such as rabbits, mice, and voles can be just as destructive. Through their chewing actions, they can cause a great deal of damage to the bark and trunks of trees and shrubs, particularly if other food sources are scarce in winter. For details on preemptive actions that can be taken to protect woody plants from these animals, see this Iowa State University Extension publication: How to Protect Trees and Shrubs from Animal Damage Over Winter.

Inspect stored tender bulbs and tubers such as dahlias, elephant ears, and canna lilies to make sure they are firm and free of mold. If the bulbs are shriveled, lightly moisten them. Make sure the temperature in the storage area is above freezing.

Clean dust from houseplant leaves periodically. A layer of dust can block sunlight from foliage, which reduces the plant's ability to photosynthesize. It can also weaken a plant, making it more susceptible to diseases and insect infestations. For detailed advice on how to remove dust from houseplants, see the Ohio State University Extension publication Why You Should Clean the Leaves of Houseplants.

Monitor houseplants for insect pests. Dry indoor air can create the perfect environment for pests such as mealy bugs, spider mites, scale, white fly, and aphids. For help with insect identification and recommended treatments, check out the Clemson Cooperative Extension's Fact Sheet on Common Houseplant Insects and Related Pests.

Use de-icing products carefully on walkways, steps, or other icy surfaces to avoid damaging nearby plants. Avoid using ice-melting products containing nitrogen and phosphorus. Instead, try alternative de-icing methods that are safer for plants, such as sand, sawdust, or non-toxic de-icers.

Avoid excessive foot traffic on lawns over the winter months to prevent damaging the sod and compacting the soil. Also, avoid parking vehicles on the lawn. The weight of the vehicle can kill or damage the grass beneath the tires.

Clean and inspect all garden tools to make sure they are in good working order. Sharpen any that need it. This Oregon State Extension publication on Care and Maintenance of Garden Tools is one of many available on-line resources that describe good garden tool care. For detailed guidance applicable to a variety of garden tools, check out Maintaining Lawn and Garden Tools and Maintaining Your Garden Tools. Don't forget to inspect and maintain wheelbarrows, lawn mowers, and any other gardening equipment you own.

Clean and sterilize flowerpots that are being stored for future use. First, use a stiff wire brush to remove

all dirt and debris. Then, soak the pots for at least 10 minutes in a solution of one part bleach to nine parts water. It's important to rinse the pots thoroughly after soaking to remove any residual bleach before reuse. Bleach is designed to kill biological life. Plants can be damaged by bleach, even weak bleach solutions.

Clean and sterilize soiled seed flats or seedling trays using one part bleach to nine parts water in anticipation of reusing them to start new seedlings; be sure to rinse thoroughly.

Use this dormant season to **develop a list of tasks for the coming season's garden.** Focus on plants to be divided, transplanted, added, or eliminated once the weather breaks this spring.

It may be January and plants with blossoms are certainly scarce at this time of year, but the ornamental garden can still be interesting! So, pull on your boots, warm jacket, and mittens, and go look for plants with colorful berries, trees and shrubs with interesting bark or branching, lichens, mosses, dried grasses, dried seed pods, conifers, hardy ferns, and other evergreen plants. If you really do yearn to see something in bloom, check this link to the Lewis Ginter Botanical Garden for a listing of "January Blooms" such as stinking hellebore (*Helleborus foetidus*) and snowdrops (*Galanthus* sp.)

Featured Photo: Pat Chadwick

Upcoming Events

By Cathy Caldwell | January 2025-Vol.11,No.1

How to Prune Landscape Trees
January 14 @ 7:00 pm – 8:30 pm

Join Tree Steward Tim Maywalt to learn the best practices for pruning landscape trees to improve their health and appearance while reducing the risk of branch failure. We'll cover basic tree pruning concepts; where, when and what to prune; how to minimize decay resulting from pruning cuts; types of pruning cuts; and tools, tool maintenance and safety. Not covering pruning fruit trees for production, pruning shrubs or topiary; mainly focusing on pruning young landscape trees.

⇒Register on Eventbrite Here

Garden Basics: Indoor Gardening

POSTPONED!

Coming up in February . . .

Garden Basics: Tool Talk—The Right Tools for the Right Gardening Tasks

February 22, 2025 @ 2:00 pm – 4:00 pm

FREE

Choosing the best tool for your gardening chores will save time, energy, and your back. We will demonstrate the safe use of basic tools so that all your garden tasks go smoothly. Power tools will not be discussed in this program.

Space is limited. Registration will close at 5 p.m. February 21 or when the class is full.

Garden Basics is a partnership with the Bread and Roses ministry at Trinity Episcopal Church in Charlottesville.

⇒Find out more and Register Here

Invasives Watch

By Cathy Caldwell | January 2025-Vol.11,No.1

Winter is a good time to attack many invasive plants, and in fact, that's the focus of the upcoming Winter Meeting of Blue Ridge PRISM. You won't want to miss this **free webinar on January 8, 2025,** 11:30 am–1:00 pm on Zoom. You can submit questions to the panel in advance. Find out more and Register Here.

For winter control activities, the experts at Blue Ridge PRISM advise:

> *"For many invasive shrubs and vines, we recommend waiting for a warm winter day after a good, soaking rain or snow melt. This is a great time to get outside and work on removing invasive plants as the ground will be soft and many shrubs and vines can be pulled right out. Wineberry, Periwinkle, English Ivy, and Winter Creeper are just a few examples of invasive plants that are ideal for winter removal."*
>
> — *"Can I Remove Invasive Plants in the winter?"/Blue Ridge PRISM/Frequently Asked Questions*

Autumn olive (*Elaeagnus umbellata)* is one of the shrubs that can be treated in winter. According to the Blue Ridge PRISM/Autumn Olive Fact Sheet, autumn olive "can be controlled at any time of year, except during spring growth, by **cut-stumping** or **hack & squirting."** For the "cut stump" method, "Cut or saw all stems to several inches from the ground and immediately spray cuts with a concentrated recommended herbicide." For the hack & squirt method, "Make hacks 2 inches apart in stem circumference and apply concentrated herbicide." One other method — **basal bark —** can be employed when the plant is small, with **stems of 6 inches or less in diameter.** The basal bark method is recommended for the dormant season because it involves spraying or painting herbicide so as to cover all the stems from ground level up to about 10 inches.

Garlic Mustard (*Alliaria petiolata)* can be treated in winter by pulling, but only in limited situations. To eradicate garlic mustard, understanding its life cycle is key. According to Blue Ridge PRISM,

> *"garlic mustard is a biennial that completes its entire lifecycle in two growing sea- sons. Its seeds germinate any time from spring to fall. The* ***first-year plants spend the winter as ground-hugging rosettes of evergreen leaves****. Second-year plants send up flower stalks in early spring, form seeds in late spring and early summer, then die.*

If the soil is moist, you can pull a first-year rosette in winter. But if garlic mustard has gotten well-established on your property, pulling a rosette may bring seeds to the surface, and you'll have new seedlings popping up in the area. Another option is to spray herbicide on the evergreen leaves. If you've had a garlic mustard problem for several years, you'll want to follow the guidance found at Blue Ridge PRISM/Garlic Mustard Fact Sheet.

Most invasive vines can be treated during winter with the cut stump method. However, for **Japanese honeysuckle,** choose a warm day in winter to use a foliar herbicide spray on the evergreen leaves.

Check out the **PRISM's recent Weed Alert** for all the details on controlling **Asiatic bittersweet:**

> *Now is the time to identify and control this invasive vine since it is easy to spot during this time of year. Use our guide to identify Asiatic bittersweet (Celastrus orbiculatus) in the landscape. Identify and control small infestations before they get too large and harder to control. Because it can spread so quickly and smother almost anything in its path, Asiatic bittersweet aka Round leaf bittersweet (formerly known as Oriental bittersweet) is rapidly taking over many*

American forests. As a result, the United States Department of Agriculture considers the Asiatic bittersweet (Celastrus orbiculatus) a national invasive species. Asiatic bittersweet is also listed as a noxious weed in the Commonwealth of Virginia.

Act now (when it is easy to spot) to identify and control this invasive species on your property!

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CONTROL

One of the best ways to combat invasive species is by identifying small infestations and removing them before they grow larger and harder to control. To ensure long-term control of Asiatic bittersweet, monitor treated sites for several years for seedlings and root regrowth. Treat these as soon as possible.

Manual: *Seedlings are easiest to remove when the soil is moist and the population is small. Pull steadily and slowly to minimize soil disturbance and tamp down the soil afterwards; make sure to remove the crown and all large roots. In small infestations, larger plants can also be removed by digging if care is taken to remove all roots.*
Do not pull vines from trees; this is hazardous to people on the ground and can damage the trees.

Cut Stump: *Cut small to large vines near ground level using a hand pruner, hand-saw, or chainsaw. Immediately apply a concentrated herbicide such as glyphosate to the cut stump to prevent re-sprouting. This can be done from June through February (before sap starts flowing upwards in the early spring).*

If you'd like to receive these Weed Alerts via email, sign up here.

For all herbicide recommendations, the Blue RIDGE PRISM relies upon the Virginia Department of Forestry's "Non-Native Invasive Plant Species Control Treatments: Timing, Methods and Herbicide Rates," Control Methods/Blue Ridge PRISM.

You'll want to check out a **new feature** on the website of Blue Ridge PRISM: **Virginia Invasive Plant ID & Control Tool**, which is an easy-to-use chart which contains photos, videos, and control information for a large number of invasive plants.

Featured Photo: garlic mustard rosette by Cathy Caldwell

Animals In Winter

By Deborah Harriman | January 2025-Vol.11,No.1

How are you spending January? When winter arrives, humans endure the cold by changing our environment. Some flee to warmer climates but most of us turn on the heat and bundle up in extra layers of clothing. How, I wondered, do other animals survive in the cold and snow? Snuggled in front of the fire in my slippers and under a blanket, I read *Winter World (Harper Collins, 2003)* by Bernd Heinrich. Heinrich, professor emeritus of biology at the University of Vermont, spends time at his homes in Vermont and western Maine, observing and chronicling the wonders of the natural world. Traveling through the winter landscape with Heinrich, I learned that animals use a variety of skills to survive winter. In this article, we will explore animals' main winter survival techniques and examine the strategies of a few particular animals.

DANGERS OF WINTER

Animals face two dire circumstances in cold weather.

- Scarcity of food and water: Finding nourishment is paramount for animals in winter. The landscape is barren and water can freeze so finding food is an ongoing struggle. Seeds and insects have vanished and small animals go underground, making it hard for predators to find them.
- Cold temperatures: Seventy percent of an animal's cells are water. As temperatures turn cold, the cells that provide an animal its energy have trouble functioning. When an animal's internal temperature goes below freezing, the water in the cells freezes and the animal dies.

WINTER SURVIVAL METHODS

Animals use three survival strategies to avoid freezing to death. The can rely on one or a combination of these techniques:

- Migration: moving away from the cold
- Dormancy: lowering body temperatures and slowing body functions to conserve energy
- Adaptations: employing techniques, including evolutionary structures, to survive cold temperatures

MIGRATION

Some animals change their habitat by moving to a new area when cold weather approaches. Traveling by land, air, or sea, many animals move great distances to a warmer destination. Successive generations of Monarch butterflies fly up to three thousand miles from the U.S. to their winter home in Mexico. Caribou in Alaska walk more than 2,000 miles to their winter home. Humpback whales swim from the icy Alaskan waters to the tropics of Hawaii, making a round trip journey of up to 10,000 miles. Not all migrations, however, are lengthy. Travelers, such as mule deer in Montana and birds that live high in the mountains in the summer, make shorter “altitudinal” migrations to lower elevations to find warmer temperatures and less snow.

DORMANCY

Some animals go dormant or hibernate through the winter. During hibernation, the animal curls up in a ball to conserve body heat and stay warm. Its body temperature and respiration decrease and its heart rate slows down. By using less energy to stay alive, the animal no longer needs to seek food but can live off the fat reserves it has stored in the fall. Hibernation occurs over a long period of time and the type of hibernation varies. Rodents, such as groundhogs and chipmunks are true hibernators. They burrow into the ground where their body temperatures and heart rates drop to extreme lows and their breathing slows. In true hibernation, the animal cannot be awakened. Torpor is a shorter version of inactivity. Raccoons and gray squirrels stay active during the winter and go into a torpor or an occasional sleep when temperatures turn frigid. Birds were often thought to either migrate to a warmer environment or were resistant to cold. Scientists now know that some birds, such as nighthawks, chickadees and some hummingbirds can enter in and out of torpor as temperatures demand. Brumation is the term used to define the dormancy of reptiles such as turtles.

ADAPTATION

Staying warm

Do you notice how racoons seem to be much larger and deer seem to be darker in winter? They, like other mammals, grow a thick, dense coat in winter to cope with colder temperatures. Aquatic animals like otters, minks, and muskrats have a double layer of fur, with fine hairs near the body covered by the longer, outside hairs. They rub body oils on their fur so water will not soak in. Deer and moose have winter coats with hollow hairs. The trapped air adds a layer of insulation. Bird feathers are not just for color and flight. Made of keratin, they are designed with rows of barbs attached to a single shaft. They interlock to create a nearly solid outer surface around the bird. Down feathers under their outside feathers provide an additional layer of insulation. Birds also rub oils along their outside feathers so rain will slide off rather than soak in. After enjoying a high protein diet when young so they grow fast, overwintering adult birds switch to a high energy diet of seeds and fruits. Birds fluff up their feathers to trap air which adds a layer of insulation. They tuck their heads under their wings when roosting and shiver to stay warm.

Some birds aggregate or flock together to share warmth. Ducks, geese and other water birds have an extra layer of fat for protection and also rub oils along the outside of their bodies so water slides off their backs. Water birds keep their feet and legs warm through a system called counter-current heat exchange. Their veins and arteries are close to each other so that warm blood leaving their bodies warms up the cold blood returning to their bodies. Flocking also is a defense against predators, at least for those away from the edges of the flock. Lookout birds alert the others of an encroaching hawk or other predator. Aggregating also is common among other animals. Bats often gather in a cave to keep warm and flying squirrels huddle together to conserve body heat. Lady bugs, stink bugs and garter snakes are a few of the creatures massing together in crevices or under rocks to avoid freezing and predation.

Canada Geese. Photo: Peter O'Connor, CC BY-SA 2.0

Finding food

Animals that stay active in the winter, such as coyotes, bobcats, owls, and hawks need to keep eating. They hunt for other living creatures but also scavenge on carcasses of dead animals. The digestive enzymes of deer and moose change so they can feed on twigs and bark. They will also dig through snow or duff looking for left-behind acorns and other nuts. Birds that stay through the winter such as chickadees, woodpeckers, sparrows, and finches look for berries that hang on into the winter and search for overwintering insects in tree bark and crevices. They look for seeds in forbs and grasses left standing or fallen to the ground. Robins, often thought of as the harbingers of spring, actually do not migrate. Rather they change their dietary requirements from earthworms and insects to fruit, and leave suburban tracts for forested areas. They switch back to an earthworm diet and appear in yards when the soil warms and softens in the spring and worms are available.

Conserving energy

Deer and other mammals restrict their movements, staying near sources of food and water. They look for tree cover to enjoy milder temperatures, protection from wind, and less snow. Most salamanders of the Appalachian Mountains spend the winter underground, moving little and burning as few calories as they can. The red-backed salamander, on the other hand, is active during the winter and stays near ant colonies to have a steady food supply. Fish are cold blooded so do not have to generate heat to stay warm. They do slow down and find habitat that does not require them to swim fast or hard. In deep lakes, they cluster in schools in the deepest part where there is more oxygen and the water warmer. Their metabolism slows down, reducing their need for food and oxygen. In shallow water, ice and snow can block sunlight, reducing oxygen levels which can be deadly.

Burrowing and Tunneling

Many species go underground to escape the cold. Mice and voles burrow under leaf mold or into the soil. They sometimes live in cavities of rotting stumps. In these subterranean tunnels, they feed on hiding insects. Many species take shelter from cold and wind by burrowing into thickets and dense shrubs. Beavers cut down trees and pile branches into the water. They cover their lodge with more sticks, mud, and rocks and use an underwater entrance. Here they are protected from predators and, like other water mammals, their double layer of fur keeps them warm. They feed on the twigs and bark gathered in the den. Snow has great insulating properties. Ruffled grouse tunnel into the snow at night for shelter and to stay warm. In snowy areas, moles, voles and other small animals do the same. In their snow tunnels, they feed on seeds and grasses left behind and are insulated from the cold. They are also somewhat, but not completely, protected from predators. Larger animals can struggle to find food in the snow but have adaptations that enable them to find their hidden prey. Coyotes and foxes locate voles by sound and pounce with their front paws through the snow, crashing through the tunnels and trapping their prey. Great grey owls can hear a vole's movement under the snow from thirty feet away. They take a diving plunge and can drive through crusted snow with their balled up feet.

Red Fox Mousing. Photo: Gouthan 89, CC BY-SA 4.0, wikimedia.org/wiki/File:Red_fox_mousing.jpg

Tolerating the cold

Many species have evolved to tolerate winter weather. In addition to changes in fur and undercoats, the size of an animal plays a role. Animals living in very cold climates are often very large – think of polar bears. Small animals, like the pika, a relative of the rabbit, have small ears and appendages close to the body that resist frostbite. The fur of some animals, such as snowshoe hares, weasels, and Arctic foxes turns from brown to white in the winter. The white color offers camouflage from predators and is also a thicker, better insulator.

BIOLOGICAL WINTER SURVIVAL TECHNIQUES OF SOME COMMON ANIMALS

Surviving winter may sound simple, but it actually involves amazing biological adaptations as shown in the techniques of some animals common to our area.

Black Bears

When we think of hibernation, we usually think of black bears so it is worth examining the biology behind their winter slumber. Bears are not true hibernators but enter a state of deep sleep. This long winter rest is an amazing biological feat. Hibernation is triggered by chemical changes in a bear's blood. In late summer and fall, bears go on a feeding frenzy and take in about five times more food than normal to add a layer of fat. By late fall, the fat cells secrete a hormone called leptin. Leptin circulates in the blood and affects the appetite centers in the brain, suppressing the bear's appetite. No longer hungry, the bear knows it's time to head to the den. Bears make dens under piles of brush, bushes, fallen trees, masses of tree roots, or rocks. They remain in their winter den for up to five months, staying alive on their fat reserves. Humans need water to remove toxins from their blood through urination. The hibernating bear, however, is metabolizing fat and

so does not accumulate much urea in its blood and does not need water to flush it out. Urea that accumulates is converted to creatine, which is non-toxic, and nitrogen wastes are biologically recycled back into protein. When spring arrives, the leptin decreases and the bear, hungry again, knows it's time to leave the den. While hibernating, bears do not undergo an extreme temperature drop. Instead they grow a thick coat of fur before winter arrives to conserve warmth. Pregnant bears give birth to their cubs during hibernation. The mother sleeps while the cubs nurse and grow until the family emerges in the spring. The hibernation cycle coincides with decreasing daylight and food supply in the fall and the increase of both in the spring.

Turtles

Turtle hibernation is called brumation. They are ectotherms, meaning their body temperature drops or rises to match the temperature of their surroundings. The adjustment of their temperature enables aquatic turtles, such as painted and snapping turtles, to spend the winter buried under mud in frigid water and even under ice. Their body temperature drops 90% to about 39° Fahrenheit, or just above freezing and their blood oxygen level drops to near zero. Painted turtles can survive three or four months in this condition. They exist on food they have stored in their bodies and take in oxygen from the water as it passes over their blood vessels in their skin, mouths and cloaca (the terminus of the digestive tract at the hind end). When oxygen is depleted, aquatic turtles switch to anaerobic respiration. While anaerobic metabolism does not require oxygen, it can cause lactic acid to build up in the body. To avoid damage from lactic acid in the tissues, their skeletons and shells release carbon to neutralize the lactic acid. Terrestrial turtles, such as box turtles, also brumate. Brumation begins when cold weather starts and daylight decreases, generally in October or November. In preparing for brumation, turtles will feed copiously to gain weight before stopping eating and burying themselves underground They use their strong forefeet to dig into soft earth or into hollow logs until they get deep enough to escape freezing temperatures. Insulated in their burrows, their metabolic rate, heart rate, and breathing slow down. Glycogen, a form of glucose, stored in their bodies, gives them enough energy to survive their torpor. This period of inactivity is a not just for survival, but helps regulate hormones, particularly those involved in reproduction.

Frogs

Like aquatic turtles, aquatic frogs hibernate under water in the winter, but cannot slow down metabolism enough to survive buried under mud. Needing oxygen, they stay on top of the mud or partially buried. They even occasionally swim around. Some terrestrial frogs and toads do burrow deep into the soil. Others, such as tree frogs hide in crevices of logs and rocks, under leaf litter, or in abandoned rodent tunnels. When exposed to freezing temperatures, frogs do not die. Their livers produce glucose to increase blood sugar levels and limit the formation of ice crystals. Wood frogs have been found almost completely frozen with no brain activity or heartbeat. When temperatures warm above freezing, they thaw out and their brains and lungs start to function.

Insects

Often we wonder if cold winters will diminish the numbers of some of our unpleasant insects, such as mosquitoes and Japanese beetles. The answer is "no." Insects have a variety of methods to survive harsh winter weather. Monarch butterflies make their treacherous journey of thousands of miles, but other insects perform less dramatic migrations. Unhappily for farmers, crop pests, such as potato leafhoppers and armyworms, will die in cold northern areas, so move south to warmer states and then move back north when temperatures warm. Other insects stay year-round and overwinter as eggs, larvae, pupa or adults. Praying mantids lay eggs which survive the winter. The adults hatch in the spring. Many insects spend the winter in the larval or pupal stage. Some, such as Japanese beetle grubs, burrow deep into the soil to avoid freezing. Female native bees build nests in plant stems, underground or in the crevices of logs or even buildings. They

provision the nests with pollen and lay their eggs before dying. The eggs hatch and the larvae subsist on the pollen until they emerge as adults in the spring. Many Lepidoptera larvae (caterpillars) hide under leaf litter or in hollow logs. To protect themselves from freezing, many larvae replace the water in their bodies with glycerol that acts as an antifreeze. Some insects hibernate as adults in crevices of trees, in leaf litter, and under rocks and logs. Some wasps shelter in the eaves of houses or outbuildings. The Mourning Cloak butterfly overwinters as an adult, building up glycerol in its body to prevent freezing. This is the first butterfly you will see in the spring.

Chickadees

Lively and friendly, chickadees are among our favorite backyard visitors. These tiny birds use a variety of strategies to endure cold winters. Chickadees living in the north have evolved to be 25% larger than Southern chickadees, their greater mass offering better cold resistance. All chickadees have a denser layer of down insulating feathers than other songbirds of similar size. They are adapted to and can find food in a variety of habitats: coniferous forests of the north, deciduous forests, marsh land, and often sparsely landscaped suburban yards. Chickadees plan ahead and lay in a stockpile of seeds before cold weather sets in. They have a seasonally-enlarged hypothalamus that allows them to remember where they have stored their caches. At night, chickadees prefer to nest alone in cavities of trees or logs. Without companions to share warmth, they go into torpor, reducing their body temperature by 12-15^{o} and slowing their metabolism as much at 30%. By morning, the fat reserves they accumulated during the day are depleted. They shiver for a while so they can rouse themselves and start foraging again. During the day, they remain warm by exercise and sunning.

HOW YOU CAN HELP

We can help wild animals in winter through our gardening practices by offering nesting and overwintering places.

- Let leaves remain undisturbed in beds
- Allow stems of native perennials to remain in place until spring
- Leave some areas un-mulched and the soil un-disturbed
- Let rocks and logs stay in place
- Build a brush pile or rock pile

QUESTIONS FOR THE FUTURE

Scientists are still unravelling the mysteries of animal winter survival strategies. How can bears and other hibernators stay immobile for so long yet awaken without loss of muscle or bone mass? After burning fat for months, their cholesterol levels rise yet they do not have hardening of the arteries. Can studying the physiological changes of an animal during torpor lead to therapeutic strategies for humans? As warming temperatures alter the blooming time of plants, will insects and migrating birds be affected? How will burrowing animals manage in wet snow that does not provide the insulating power of dry cold pack snow?

Winter eventually ends. The increasing warmth and daylight stir animals out of their dens and migrating creatures return. Buds and insects appear and the summer cycle begins.

Feature Photo: Black-Capped Chickadee by Vickie J. Anderson, CC-BY-SA 4.0

SOURCES:

Butterfly Migration and Overwintering, U.S. Forest Service

The Courage of Birds, (Chelsea Green Publishing), Pete Dunne

History, Purpose and Status of Caribou Movements in Northwest Alaska, National Park Service

How Do Insects Survive Cold Weather, University of Illinois Urbana-Champaign Extension

How do Turtles Survive the Winter?, Carlton College, Cowling Arboretu

How Wildlife Handle Winter, Massachusetts Division of Fisheries and Wildlife

Humpback Whales, National Park Service

Where Do Pollinators Go In Winter?, Xerces Society

Where Do Frogs Go in the Winter?, Virginia Department of Wildlife Resources

Wildlife in Winter, Purdue University Extension

Wildlife Winter Survival Strategies, National Wildlife Federation

Winter World, (Harper Collins, 2003) by Bernd Heinrich

Growing a Variety of Sweet Potatoes

By Gena Breakiron | January 2025-Vol.11,No.1

Not your average potato

Mention the word potato, and most people will assume you are referring to the "Irish" potato (*Solanum tuberosum).* Aptly named the Irish potato, it was introduced to North America by Irish immigrants. However, it originated in South America, and was brought to Europe in the late 16th century. It is part of the *Solanaceae* or nightshade family.

Photo by Gena Breakiron
There's more to love about sweet potatoes than the orange-fleshed standard.

The sweet potato (*Ipomoea batatas*), along with the morning glory, is in the bindweed or *Convolvulaceae* family. It originated in Central and South America, and was tasted by Columbus and his entourage, who eventually took it to Europe in the late 15th century, well before the popular "Irish" potato.

The structures of the two types of potatoes are very different. The sweet potato is actually a root structure, meant as a storage device for carbohydrates and nutrients to be used by the plant when the availability of these are low.

The Irish potato is a tuber, and is an extension of the stem of the plant, not the root. It stores nutrients also, and allows the plant to regrow in better conditions. The development of the "eyes" is an indication the plant is attempting to regrow.

Confusingly, sweet potatoes are often called, and labeled by markets, as yams. Yams (*Dioscorea villosa*) are very different. They are from the family *Dioscoreaceae*, which includes lilies and some grasses. Yams originated in Africa, and are, like the Irish potato, an extension of the stem. They can grow to be very large, are very starchy rather than sweet, and have tough, bark-like skin. They are often cooked and mashed into a starchy paste.

Nutrition

Sweet potatoes are a great source of vitamin A (in the form of beta carotene), vitamin B6, vitamin C, potassium, and fiber. Orange flesh sweet potatoes are richest in beta-carotene, while purple sweet potatoes are richer in anthocyanins. Both are phytochemicals celebrated for their role in human health and disease prevention. While their glycemic index and glycemic load is not as high as that of "Irish" potatoes, you'll still want to enjoy light portions. This is especially important if diabetes is a concern. You can read more about sweet potato nutrition from Harvard University .

Cultivation

Growing your own sweet potatoes is relatively easy, and can be extremely rewarding. They can be grown in the ground, in raised beds, or in large containers.

The sweet potato is a warm weather crop and will require 85-120 days to mature. According to the Virginia Tech Planting Guide, in our plant hardiness zone, 7b (which the USDA changed in November of 2023) you can plant sweet potatoes in mid to late April. Since you will be planting a rather delicate "slip", you'll need to protect them if the threat of frost arises. However, since you can harvest as late as October, you may want to wait a little longer. You could plant as late as June, and still have plenty of time for them to grow before harvest time. They grow best in light sandy soils, but will grow well in clay soils amended with organic

matter. Plan on getting a soil test in your garden at least every three years. You can find information about soil testing at the end of this article.

If you are ready to grow sweet potatoes, start by working in some good compost. If you do not have sandy soil, you'll want to mound the soil where you expect to plant. This will help warm the soil more quickly, but it will also give the potatoes an easy place to grow, and help to provide good drainage. Plant the transplants (called slips) in rows 3 feet apart with 8 to 12 inches between plants in the row, at a depth of 3 to 4 inches. Water in transplants, and keep them well hydrated while they establish their roots.

Photo by Gena Breakiron

Propagation

There are many ways to obtain slips. (Slips are basically a rooted stem of the sweet potato plant.) You can purchase them from a reputable source, but when you propagate your own, you'll know exactly what you are getting. There are several ways to grow sweet potato slips.

One way is to obtain sweet potatoes from a grocery store. The number will depend on how many plants you want to grow. Some grocery stores offer several varieties, which will allow you to experiment with something new. I suggest you purchase organic sweet potatoes. A local store that specializes in organic produce had 5 different varieties from which to choose. Pick potatoes with an obvious top and bottom. The top will be pointy, and the bottom will be flatter. Potatoes can produce more than 30 slips, but plan on 8-10 good, healthy slips from a single potato. To make the slips, wash the potato and push 4 toothpicks in the sides of the potato a little more than halfway down the potato. Place the potato in a jar of water. The bottom part of the potato should be well submerged. Let it sit in a sunny window. Don't be discouraged. It could take a few weeks for them to begin sprouting. Some cultivars will sprout more quickly than others. Give them fresh water at least once a week. When the sprouts emerge, let them remain on the potato until they are a few inches long. Then, carefully pinch off the stem, allowing a little of the potato to come off with the stem. Place the stem in water and let it root. Surprisingly, they will begin to produce roots in a day or two. Continue until you have enough rooted stems (or slips) to plant in your prepared space.

Photo: Gena Breakiron

Another way to propagate your own slips, is to purchase those same potatoes, but this time, slice the potato in half lengthwise. Place the potato, cut side down, in a tray filled with soil. Nestle it down firmly in the soil. Be sure to water it as needed. Once the sprouts emerge, follow the directions above to create the slips.

Additionally, there is a third method for obtaining slips. I prefer this method as it is the easiest. When I

harvest my sweet potatoes, I save some of the healthiest vines from the sweet potato varieties I want to propagate. I prepare a large flower pot with soil and I plant the salvaged vines. Be sure there is a saucer because you will need to water it weekly. Also, as it grows you can contain it somewhat by curling the vine back into the pot. About two weeks before I am ready to plant the sweet potato slips, I cut the vine into sections. Cut just below the leaf node (where the leaf emerges from the stem) and remove that leaf from the stem. This is where the roots will emerge. Be sure to leave a leaf at the other end of the stem to help the slip photosynthesize. Place these cuts in water and watch the magic! Roots should appear in just a day or two. While this can be an easy way to produce slips, it does require caring for the potted plant from harvest time through approximately 2 weeks before planting time. It does take space to keep the pot in the house, but I find it well worth the time and space.

Varieties and Cultivars

If you choose to start your own slips from purchased potatoes, you will find a number of cultivars available. This past year, I grew 3 different cultivars. I grew the ever popular Beauregard, which is by far the most popular sweet potato in the US. It is somewhat uniform in shape and size, it is resistant to disease, and it's credited with saving the sweet potato industry. The Beauregard has bright orange flesh, and is sweet and high in moisture content. It lends itself to a variety of dishes both sweet and savory. However, not much can beat a roasted Beauregard sweet potato with butter. I find it a valuable addition to curries, soups, and salads alike. Additionally, the leaves of the sweet potato vines are usually abundant, and completely edible. Look online for recipes.

Covington and Jewel are equally loved, orange-fleshed sweet potato cultivars that can replace Beauregard. In fact, there are many cultivars of orange-fleshed sweet potatoes. You can read about some of them here.

I also grew the cultivar Garnet. This is an interesting sweet potato with a reddish-purple skin and deep red-orange flesh. It is also sweet, but it has an earthy flavor that is more complex than other orange-fleshed sweet potatoes. I will be growing Beauregard and Garnet sweet potatoes again this year.

The third sweet potato cultivar I grew this past summer was a purple variety. There are a number of purple sweet potato varieties. The University of California notes these four varieties:

Stokes — These are purple on the outside and inside. These are dry and not very sweet. I grew this last year, and we didn't love it. While it's high in the antioxidant anthocyanin, I prefer to get mine from blueberries.

Okinawan — These are also known as Hawaiian sweet potatoes. They are beige on the outside and purple on the inside. Apparently, they are slightly creamier than Stokes. I have not seen this variety in the store where I buy my organic sweet potatoes.

Murasaki –– These are also known as Japanese sweet potatoes. They are Purple on the outside and creamy white on the inside. I purchased one of these for propagation. I'm excited to try it.

Ube –– Although UC lists this as a variety of sweet potato, they note that it is in actuality, a yam. Apparently, it's brown on the outside and purple on the inside, and is used in desserts.

Additionally, there are white sweet potatoes, which are white both inside and out. There are several varieties or cultivars, however, there is not much literature available regarding white sweet potatoes. I'll be growing some this year, but I don't know what variety I chose from the store, as they are not labeled with cultivar or variety.

If you'd rather buy slips, check with reputable seed companies or organizations for the variety you desire.

Next Steps

Once you have chosen your varieties, propagated and planted your slips in your prepared bed, and they have begun to grow, what's next?

Disrupting sweet potato vines
Photo by Gena Breakiron

The sweet potato is a vine, and it can produce a lot of plant matter. You'll want to keep these vines from attaching to the soil. At every leaf node there is a potential plant. The vines attempt to grow new plants all along the vines. Allowing this process will take energy away from the mother plant, resulting in inferior sweet potatoes. The answer is to visit your plants at least once a week, and pull the vines from the soil up to the mother plants. Then, be sure the sweet potatoes growing from the mother plants are well covered by soil.

Combating Pests and Diseases

Unfortunately, there are often systems working against your efforts. There are a few fungal diseases that can affect your plants, but most of the varieties or cultivars available today are developed to be resistant to fungal diseases. Nematodes, however, are microscopic, thread-like roundworms that live in some soils. They can cause root knots. which can cause damage to your sweet potatoes. You can read more about it from NC State, here.

The biggest adversaries I and many other gardeners face are voles or other rodents, and deer. Don't worry if you have moles (they are not rodents!) because they eat grubs and worms. The voles, however, often use the mole tunnels for travel, and they eat roots! PMG's Nancy Bolton wrote a great article about voles and moles which you can read here.

If you have deer, the only thing you can do to deter them is to erect a good fence. They will eat almost anything you plant. See Deer, Deer, Deer!

Harvesting and Curing

If you have been successful in growing sweet potatoes, you'll need to harvest them. You can leave them in the ground until frost threatens. You could harvest them after a light frost, but if you choose to save the vines for next year, frost will damage the vines.

When digging the sweet potatoes, be sure to give a wide berth around the mother plant with your shovel. Dig deeply, but carefully. Brush the soil aside and remove the sweet potatoes. If your soil is rich with organic matter, it shouldn't be too difficult to move most of the soil by hand. Set the sweet potatoes out and let them dry a bit. Remove large deposits of soil, but do not attempt to remove all the soil at this point. The skins are very tender, and you'll risk damaging them. I place mine gently in large plant crates with lots of ventilation, and let them sit in the shade for a day or two to dry. This will allow the skins to dry and toughen up a bit. Then, I brush them gently to get most of the dirt off and put them back in the crate for storage. Don't wash them until you're ready to use them. Some gardeners lay them on paper on the basement floor. They need to be left in a warm, humid environment for a week or two to cure. Curing allows the starches to convert to natural sugars. This is what puts the "sweet" in sweet potatoes. Read more about curing sweet potatoes here.

Photo; Gena Breakiron

Whatever you decide to grow, have fun with it. Learn as you go, and don't hesitate to ask for advice. If you find me, or another vegetable gardener, you'll likely find someone who loves to talk about vegetable gardening. Try something new every year. Most importantly, enjoy your time in the garden and your bounty on the table.

The Help Desk and *The Garden Shed*

Resources for your questions are the Help Desk and this newsletter. *The Garden Shed* is searchable by topic, so you can easily locate older articles. Look for "Search this Site" on our main page.

If you are having issues with your plants, you'll want to submit a soil sample, or if you have questions about gardening, you can call or email the Master Gardener Help Desk, Piedmont Master Gardener Help Desk.

Featured photo: Gena Breakiron

SOURCES:

Soil Testing Information

Piedmont Master Gardener Help Desk

Growing Sweet Potatoes-University of Maryland

VA Tech extension Home vegetable planting guide

Information about Yams-Britannica

Clemson Univ- Home and Garden info-sweet potato

NC State University Sweet Potato Varieties

University of California Purple Sweet Potatoes

PMG-The Garden SheNC State University – Curing Sweet Potatoes.

Penn State-Parasitic Nematodes Explained

Potatoes, Sweet Potatoes and Yams-What's the difference?

Sweet Potato History -LOC

Brief History-Sweet Potato