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Fall transplanting hacks

It's a good time to evaluate, plan and divide perennials

By Corinne Frey, vcfrey@yahoo.com

Fall is a favorite time of year for many gardeners. Not only have they enjoyed the fruits of their labor, but it's also an excellent time to re-evaluate for the next season.

At this time of year, gardeners often ask:

Which perennials are best to transplant in the fall?

For roots to establish, a good rule of thumb is to divide spring and summer blooming perennials four to six weeks before the ground freezes. Waiting until the plant has stopped flowering will aid in rooting and help the plant regenerate. A comprehensive spreadsheet compiled by the University of Minnesota Extension service provides common name, scientific name, how often to divide, when to divide, and troubleshooting tips for more than 100 plants seen in northern gardens. The spreadsheet is alphabetized by common name, so it's very user friendly. Allium, aster, astilbe, blanket flower, goldenrod, lamb's ear, mint, and shasta daisy are a few of the perennials included on the fall transplant list.

A link to the spreadsheet is provided at the end of this article.

Why should I divide perennials?

Dividing perennials helps the plant perform better because there is more space for roots, which in turn, increases water and nutrient absorption. Division is also a good way to keep aggressive plants from taking over an area, and

neighbors and friends benefit because you will have more plants to share.

What do I cut back, and what do I leave?

Any diseased plants should be cut back or removed, and disposed of properly. Do NOT compost them. Thoroughly clean tools with a 10 percent mixture of chlorine bleach and water (one part bleach to nine parts water), do a 30-minute soak, rinse, then hang to dry. Bee balm, phlox, lilies, peony, daylily, hosta, columbine, and iris are some of the plants to cut back in the fall. Tall sedum and ornamental grasses are examples of plants that should be left because they provide interest and height during the winter months. Coneflower, black-eyed Susan, and sunflowers are examples of plants that provide vital winter feed for birds and other wildlife.

How do I divide perennials?

If the soil is dry, water the plants you plan to dig the day before transplanting. Prepare the plant's new home by tilling or loosening the soil, and adding amendments. When dividing perennials, dig out the parent plant, keeping intact as much of the rootball as possible. Lift it from the ground and remove any excess dirt. Plant roots can be gently pulled apart or cut with a sharp knife or spade.

When moving the plant to its new location, place the plant no deeper than it was in the original hole. Water new transplants thoroughly. Mulching will also increase success.

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How do I know when a plant should be divided?

When plants lose their vigor, when blooms are smaller or there are fewer of them, or when there are bare spots, a plant may benefit from dividing.

Each gardener develops his or her own techniques for designing and redesigning an area. Photographs taken throughout the growing season can be a valuable resource, as can be a permanent marker. When a friend asks for a plant, or you identify a plant that should be transplanted or labeled, use the permanent marker to write on a leaf. The writing will last for several months. A flagging system can also aid in knowing what to keep, give away or transplant. Using a variety of colored staking flags makes the job easy.

- **Red** - Take out and give away, just say no.
- **White** - Move forward, I surrender, let me out.
- **Blue** - Move back, back & blue.
- **Green** - Add a perennial, go for more.
- **Yellow** - Divide & share, caution... save some.
- **Orange** - Add a pot or annuals, amp up the color.

Carrying a 5-gallon pail containing the flags, plant markers, a labeler, printed photos, a permanent marker, and a list of plants that encourage pollinators (found by accessing the NDSU Master Gardener website link below) makes transplanting decisions easy (Fig.1).

Fall is a great time to re-evaluate and transplant. For more information on transplanting perennials, or for a list of pollinator friendly plants, follow the links provided.

Sources:

https://drive.google.com/file/d/1S6yqog4CnN_zqwG02uiOo28HT-is_LIP/view

<https://extension.umn.edu/planting-and-growing-guides/dividing-perennials>

<https://www.ag.ndsu.edu/mastergardener/pollinator>



Fig. 1. Carrying a 5-gallon pail containing multi-colored staking flags, plant markers, a labeler, printed photos, a permanent marker, and a list of plants that encourage pollinators, makes transplanting decisions easy.

10 Steps to a Winter Carrot Garden

By Lila Hlebichuk, lilahl@yahoo.com

Many of us may recall our grandparents or great-grandparents had a root cellar where they stored the vegetables and fruits from their gardens.

If stored properly they could enjoy their harvest well into spring. For some this was their only access to fruits and vegetables during our harsh winters.

It is rare to see a root cellar these days. We either can or freeze and sometimes dehydrate our produce to enjoy over the winter.

You may have a bumper crop of carrots and want an option other than freezing or canning. While it is recommended to harvest your carrots before winter, there have been reports of successfully overwintering carrots in the garden as far north as Edmonton, Alberta, Canada.

However, certain precautions should be observed.

1. You need a carrot variety known for storing well. Coreless cultivars of carrots do not do well with overwintering, so be sure to select the right variety.
2. Make sure your carrot bed is weed free and the soil is well drained.
3. Define the parameters of your carrot bed with tall markers so you can find them in the snow.
4. After the first frost or two, but before the ground is frozen, cut off the greens 1/4 to 1/2 inch above the carrot top so they do not continue to draw energy from the carrots.
5. Cover the carrot crowns with a thin layer of soil.
6. Apply at least 12 inches of mulch in the form of dry leaves, straw, or hay and be sure to cover the ground at least 12-18 inches out from the carrot bed. You do not want the mulch to be soggy, which could result in mold.
7. Cover the mulch with burlap and/or a tarp to keep your mulch in place from the wind.
8. Hopefully there will be snow cover to provide additional insulation.
9. You can harvest your carrots in early spring when most of the frozen or canned vegetables from your supply have been



consumed. Be sure to harvest early because the carrots become inedible once they flower.

10. You can also try removing some snow, the tarp, and some mulch to harvest carrots during the winter. However, most of us prefer to not tromp through the snow and dig carrots in cold weather.

Happy winter gardening!

Sources:

Gardenerspath.com How to store carrots in the ground by Kristina Hicks-Hamblin

Harvesttotable.com How to Harvest and Store Carrots



Cover crops can help you win at playing the garden game

By Caitlin Stegmiller, Cait.steg@gmail.com

Lately, I have been playing strategy board games in the evenings. Games like chess and Risk are a good way to pass the increasingly dark evening hours. And as I learn to think strategically and plan one or two moves ahead of my opponent, I've realized this same thought process should be transferred into the garden.

Thinking one or two seasons ahead can help us make the best moves for our gardens in the present, and planting cover crops is a great strategic move to make this time of year.

Just like gaining control of the game board, cover crops can help gardeners gain control of their plots. By strategically planting crops like oats, ryegrass and clover we can help to improve the soil, protect it from erosion and even suppress next year's weeds.

Cover crops can be planted in the garden from spring through fall. When planted in conjunction with spring and summer vegetables, cover crops can grow to form a "living mulch," which can later be turned under to add nutrients to the soil.

There are many types of cover crops available to gardeners. The University of Wisconsin Horticulture Department has compiled a table of cover crops that do well in

the Midwest (Fig. 1).

Included on this table are legumes. These plants fix nitrogen, and when tilled under, this nutrient becomes available to other plants in the soil.

Other benefits of placing fall cover crops on the garden board include winter erosion protection and spring weed control. The root structures from crops like winter rye and wheat help protect the soil from erosion from late fall rains, and form a barrier to prevent crusting on the soil surface. Additionally, fall legumes will help to maintain nutrients that may otherwise be leached out.

Just like each chess piece has a different movement, different types of cover crops can grow during different seasons.

Winter-killed crops like annual ryegrass will not regrow in the spring. These crops can be put into play in the fall, and then worked into the soil in the early spring. They are good for areas where early spring vegetables are planted, or for gardeners who prefer less tilling.

Winter-hardy cover crops like winter wheat can be planted later in the summer and into fall. These crops survive the winter, lying in dormant wait until the spring. Then, they



Caitlin Stegmiller plans her next move against her weedy opponent on the "garden board." Photo courtesy of Caitlin Stegmiller.

regrow, taking early control of the garden game area.

With any of these players, it is imperative to keep their growth in check. Crops, like buckwheat and non-hardy annual ryegrass, can reseed at incredibly high rates. Make sure to mow or till these crops down before they flower to avoid a cover crop coup.

Many garden centers will carry ready-made cover crop mixes, which will usually include a mix of winter-killed and hardy grasses and legumes, allowing gardeners to utilize all of these cover crop players to their greatest strength across the board.

Cover Crop	Sowing	Seeding Rate Per 100 sq. ft. (10' x 10' Plot)	Does This Plant Fix Nitrogen?	Growth Rate	Primary Uses/Comments
Buckwheat	Spring, Summer	2 lb	No	Fast	Is easily worked into the soil. Attracts pollinators and beneficial insects. Re-seeds prolifically. DO NOT allow to go to seed.
Clover (Sweet)	Spring, Summer	1/2 lb	Yes	Medium	Grows better in high pH soils than other clovers.
Oats	Late Summer, Early Fall	4 lb	No	Medium	Likes well drained soils. Dies over the winter. Makes a good choice in areas to be worked early the following spring.
Peas (Field)	Spring, Early Fall	5 lb	Yes	Fast	Can outcompete many weeds.
Radish (Oilseed)	Fall	1 lb	No	Fast	Is easily worked into the soil.
Rye (Winter)	Fall	4 lb	No	Fast	Easy to grow. Grows fast. Can be planted late in the season.
Ryegrass (Annual)	Late Summer, Early Fall	1 lb	No	Fast	Easy to grow.
Wheat (Winter)	Late Summer, Fall	2 lb	No	Fast	Needs fertile soil. Does not like low pH soils.

Fig. 1. Recommended cover crops and green manures for the home vegetable garden. Source: University of Wisconsin Extension Horticulture, Doug Higgins and Kristin Krokowski, UW-Extension Waukesha County, and Erin Silva, UW-Agronomy [Information compiled from Johnny Select Seed Company and Cornell University Department of Horticulture]

Growing Garlic

By Martha Willand, marthawilland@hotmail.com

Few flavors are as pronounced or embraced globally as is the mighty garlic bulb.

A member of the *Allium* family, the name is derived from Old English *garlēac*, meaning gar (spear) and leek. But the plant's history spans far before its Western European appreciation.

Native to Central Asia and Iran, the bulb has been used as a folk remedy and for culinary use for thousands of years. During the building of the Giza pyramids, slaves were rationed garlic as it was reputed to provide strength and increase productivity. Greek athletes ate garlic as a stimulant prior to competitions and battle, and it was once worn around the necks of livestock and children to deter evil spirits in central Europe.

While previous uses made have been without scientific support, modern medical research has found many benefits for including garlic in your diet.

The active sulfur compounds within garlic that give its distinct, sharp flavors include diallyl sulfide (DAS), diallyl disulfide (DADS), and diallyl trisulfide (DATS), and all have been reported to inhibit cancers in the stomach, colon, and lung, renal, skin, mammary glands, brain and esophagus (Epigenetics of Cancer Prevention, 2019).

In addition, research from King's College London and the University of East Anglia found that women whose diets were rich in alliums had lower levels of osteoarthritis. Adding garlic to your garden and diet not only adds flavor to your meals, but can help improve your health as well.

Varieties of Garlic

There are more than 30 varieties of garlic ranging in color from white to pink to purple (Fig. 1). All garlic is grown through vegetative reproduction as they do not grow true seeds. Individual cloves are grown that result in bulbs genetically identical to the original clove.

Garlic (*Allium sativum*) is commonly divided into two main varieties or subspecies, the hardneck and softneck.

- **Softneck** (*Allium sativum* var. *sativum*).
- Softneck garlic is commonly sold in the grocery store because this type of garlic has a longer shelf life. Often called 'California garlic' based on its origin, these varieties grow well in zones 6 and higher, and the bulbs generally have 10-40 small cloves. China is also a major exporter of softneck garlic to the global market.
- **Hardneck** (*Allium sativum* var. *ophioscorodon*)
- Hardneck varieties are named for the stiff stalks that result after harvest. These varieties are planted in the fall, are grown in colder climates, and tend to have superior flavor and colorful paper wrappers. While they do not store as well, they produce larger cloves, averaging four to fifteen per bulb. Hardneck varieties also produce an edible flower stalk (scape) that holds miniature cloves called bulbils (Fig. 2). Hardneck varieties do best in North Dakota.



Fig. 1. Garlic Bulbs. Photo by Mike Kenneally on Unsplash <https://unsplash.com/photos/muv4YPu4Og4>



Fig. 2. Fresh Hardneck Garlic Scape. Wikimedia Commons https://commons.wikimedia.org/wiki/File:Fresh_Garlic_scape.jpg



Fig. 3. Garlic Plant. Google Creative Commons https://cdn.pixabay.com/photo/2017/05/23/18/33/garlic-2338086_1280.jpg

How to Grow Garlic

Soil Preparation

- Select a growing site that has been free of garlic or other plants from the onion family for at least two seasons. Remove stones from the top 6 inches of soil if needed (Fig. 3).
- Garlic should be planted in fertile, well-drained soil with full sun. If your soil is heavy, it should be lightened by mixing perlite, a light

and loose potting or seed starting mix. Raised beds can also be used, though pots are not recommended.

- Perform a nutrient analysis of the soil as garlic requires fertile soil. If needed, work in compost, well-cured manure, 10-10-10 fertilizer or bloodmeal based upon the soil test recommendations.

Timing, Spacing and Depth

- Hardneck cloves require vernalization, and thus should be in planted in the fall one or two weeks after the first hard freeze up until November in North Dakota.
- It is possible that garlic may sprout during the fall, but do not worry about the greens; they are winter hardy and will continue to grow upon spring's arrival.
- Softneck varieties are not recommended for colder climates, but can be planted once soil temperatures have reached 50° F.
- Planting depths vary according to growing zone and sources, but in North Dakota you'll likely have the greatest success by planting hardnecks to a depth of 4 inches. Plant cloves pointed end up, spaced 1 to 3 inches apart and in rows 18 to 24 inches apart, or 5 square inches per plant.

Mulching and Water

- Hardneck varieties grow an ample root system into late fall, helping to create large bulbs the following season. For this reason, it is important to protect the cloves from frost heaving. Add a four inch mulch cover or clean straw or finely shredded leaves in the fall. As greens emerge in the spring, ensure that mulch is not in contact with the plants. Leaving mulch in place can help eliminate competition with weeds.
- Garlic grows best in moist, but not wet, soil. To ensure even soil moisture supply one inch of water per week throughout the growing season.

Harvesting, Curing and Storing Your Garlic

Scapes

- Hardneck varieties produce flower stalks in early summer that should be removed to encourage increased growth to the bulbs. Cut or break off the stalks once they are ten inches long. The

scapes are edible and have a similar texture to asparagus. While the flavor is strong when used fresh, it mellows when sautéed or blanched. Use in stir fries, as crudité, or in pesto.

Bulbs

- Around July and August, the leaves begin to change from green to brown. Harvest when the bottom third of each plant is beginning to turn color. Waiting too long to harvest can result in garlic's paper-like wrappers splitting apart from the bulb, shortening its shelf life.
- Gently dig the bulbs with a spade or pitchfork rather than pulling as this can increase damage to the bulb and stem.
- Place whole bulbs (including greens) in a dry, cool, and well-ventilated location out of direct sunlight for two weeks to dry. Turn the bulbs occasionally. Once dry, brush off remaining dirt and remove stems an inch or two above the bulb.
- Garlic stores best around 32 degrees and at humidity below 60 percent, and will keep for approximately six months. Garlic sprouts fastest between 40-60 degrees.
- Dehydrating garlic can ensure bold flavors during winter months. Ground in a coffee grinder it can be used as garlic powder, or garlic salt can be made using a 4 to 1 ratio of salt to garlic powder.
- Garlic can also be frozen, but will lack its crunchy texture.
- Canning is not recommended, but garlic can be pickled alone or with other vegetables.

Garlic "Seed" Sources

While it may seem intuitive that store bought garlic cloves could be used in your garden, it's unlikely you'd have a successful crop. Most garlic found within supermarkets are either softneck varieties from California, and/or imports from China that have been treated to prevent sprouting. Local, organic farmers may be a valuable resource for local, untreated, hardneck varieties. Alternatively, you can obtain planting garlic from reputable sources online.

After a successful crop of your own, save the biggest cloves with perfect wrappers for your next planting. After a few years, you'll have developed a strain specifically adapted to your garden, and that's something to be proud of.

PLANT BLINDNESS

Our inability to value plants has long-term consequences

By Esther E. McGinnis, esther.mcginnis@ndsu.edu

The average American child can identify more than 1,000 corporate logos but struggles to correctly identify 10 plants.

What accounts for this discrepancy?

Why are children and adults "blind" to plants?

Plant blindness is a term defined by biology teachers James H. Wandersee and Elisabeth E. Schussler in 1998. It is defined as:

(a) The inability to see or notice the plants in one's own environment; (b) the inability to recognize the importance of plants in the biosphere and in human affairs; (c) the

inability to appreciate the aesthetic and unique biological features of the life forms that belong to the Plant Kingdom; and (d) the misguided anthropocentric ranking of plants as inferior to animals and thus, as unworthy of consideration.

Master Gardeners may have difficulty understanding this concept because they go out of their way to visit botanical gardens and to purchase the newest perennials. It is not unusual to see a Master Gardener fall off the sidewalk because he/she is so intent on identifying and appreciating plant life.

However, the average person is biologically

programmed to ignore plants. To the untrained eye, plants just blend together to form a homogeneous background when not in bloom. (Fig. 1) They seem immobile and non-threatening; thus less interesting than their animal counterparts. Plants seem overly familiar and not worthy of attention.

In contrast, animals get a lot of attention and social media is filled with images of charismatic creatures. They move, some are cuddly and the dangerous ones are fascinating. Yes, animals even have their own television channel, Animal Planet. When will plants get equal airtime?

Life science and biology teachers are not immune to plant blindness. They may feel less comfortable teaching plant curriculum. When given a choice, biology curriculum focuses on animal examples of various systems rather than plants. This bias continues at the college level. Most biochemistry classes focus on human and animal systems. Very few universities offer plant biochemistry classes.

While this article is written tongue in cheek, the consequences affect society, our economy, and food security.

When plants are minimized at schools, generations of students grow up to undervalue plants. This has real consequences as the pipeline of students for botany, horticulture, agronomy, plant breeding, plant pathology, weed science, and other plant science majors dries up. In the United States, post-secondary horticulture programs (certificate, 2-year, and 4-year) have decreased from 446 in 1997 to 209 in 2017.

How do we stop the bleeding?

We have to work with young people to

notice and value plants. School gardens at the elementary level are fairly common and useful in this endeavor. However, gardens and plant-based curriculum seem to be scarce in middle school and high school. High school students learn about photosynthesis and organelles in the cell but the focus is on the molecular level.

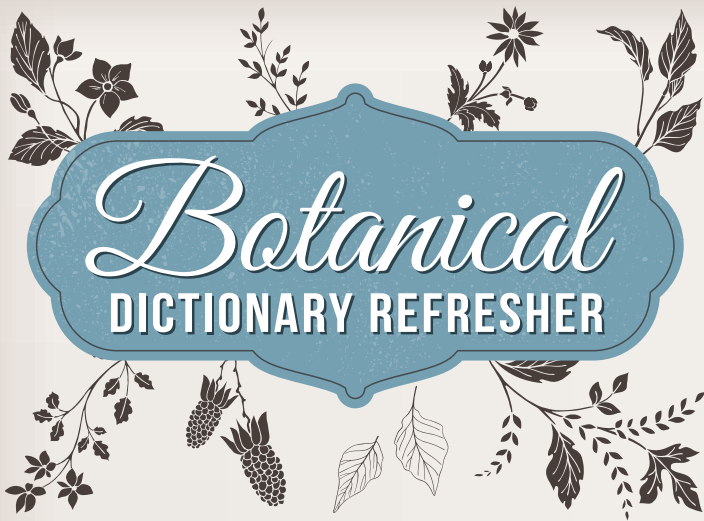
This article does not have all the answers but seeks to raise awareness. Work with your kids and grandchildren. Even when the ground is frozen, you could work with houseplants and succulents.

If you are a teacher, think about ways to incorporate plant curriculum into the classroom, especially at the middle school and high school levels. Master Gardeners can



Fig. 1. Our brains are hardwired to ignore the diversity of plant material when they are not in bloom.

volunteer to work with youth through schools, 4-H, and FFA. Over the winter, the Master Gardener Program will attempt to compile plant curriculum that will be useful for all ages.



By Lila Hlebichuk, lilahl@yahoo.com

This issue will focus on weather definitions for gardeners.

Climate Zones:

Using data measured at weather stations during the 30-year period from 1976-2005, the USDA created a map which divides North America (including Hawaii) into thirteen zones to help gardeners determine plant hardiness. Each zone is based on algorithms which include factors such as the average high and low temperatures, changes in elevation, and nearness to large bodies of water. North Dakota is divided into Zones 3 and 4, with the higher number 10 degrees warmer. Some maps further divide each zone into "a" and "b" regions with "a" being 5 degrees colder than "b."

Average minimum temperatures:

Zone 3a: -35 °F to -40 °F

Zone 3b: -30 °F to -35 °F

Zone 4a: -25 °F to -30 °F

Zone 4b: -20 °F to -25 °F

Frost/Freeze Probabilities:

- **Frost:** 33 °F to 36 °F – Plant damage varies with duration of frost.
- **Light Freeze:** 29 °F to 32 °F – Tender plants killed, with little destructive effect on other vegetation.
- **Moderate Freeze:** 25 °F to 28 °F – Widely destructive effect on most vegetation with heavy damage to fruit blossoms, tender and semi-hardy plants.
- **Severe freeze:** 24 °F and less – Heavy damage to most plants. At these temperatures, the ground freezes solid, with the depth of the frozen ground dependent on the duration and severity of the freeze, soil moisture, and soil type.

Microclimate:

The climate of a very small or restricted area, especially when this differs from the climate of the surrounding area. Urban areas with tall buildings and asphalt, large bodies of water, and natural or man-made protected areas are a few factors that can result in microclimates.

Soil Temperature:

The North Dakota Agricultural Weather Network (NDAWN) has a chart of soil temperatures at various depths. In the early spring, the soil may take longer to be warm enough for seed germination even when outside temperatures are well above freezing.

<https://ndawn.ndsu.nodak.edu/deep-soil-temperatures.html>

Wind Chill:

A quantity expressing the effective lowering of the air temperature caused by the wind, especially as affecting the rate of heat loss from an object or human body.

Feels like temperature:

The "feels like" temperature is a measurement of how hot or cold it really feels like outside. The "feels Like" temperature relies on environmental data, including the ambient air temperature, relative humidity, and wind speed to determine how weather conditions feel to bare skin.



Fig. 1. Zinnia, Benarys Giant and Zahara Mix lived up to their disease resistant properties by being strong and disease-free right up to frost. Photo courtesy of Cathy Ruebel.

Memo to Self Roundup of 2020 gardening successes & challenges

By Cathy Ruebel, Foxtail2400@gmail.com

This extraordinary year is in the home stretch, and gardening is wrapping up. What have you learned from your gardening activities this year? Did you try some new varieties, experiment with different techniques, or a new tool? (Fig. 1)

Now is a great time to make notes of what went right in your garden, and what to improve upon for next year. This memo summarizes observations and weather conditions in central North Dakota as well as an interesting hack.

A diamond in the rough

Late last fall, Bismarck residents Connie and Eric Nikiforoff purchased a two-acre property they've named Stone Cottage Orchard & Vineyard. Neglected for more than a decade with an early snow covering the extensive overgrowth, discovering what was growing in their yard had to wait for spring.

"We have put in many man hours to find the treasures of perennial plants, trees, bushes, and paths that were hidden before in the gardens," Connie said. "Now the orchard is much more accessible and we can actually find each individual grape vine.

"By far my best resource was online sites, especially when it came to pruning everything from roses to fruit trees, to other perennials, and of course the grapes," she added. (Fig. 2)

Connie felt the grapes taught her the most this year. (Fig. 3)

"You can't grow grapes without rain," she

said. "They survived because they can reach down as much as 30 feet to find moisture. But still, they needed more rain than we got."

"Our goal was to unearth, prune, discover and rejuvenate a beautiful diamond-in-the-rough property," she continued. "We've been so happily surprised at all we've discovered and very much look forward to next year"

A state divided

It seemed like the state was delineated into two distinct halves in 2020 - East Dakota with too much moisture, and West Dakota sliding further into drought conditions.

Last year's abundance of moisture in the eastern half of the state was aggravated by even more precipitation this year. Further west, the Missouri River valley and points west languished on the other end of that spectrum, currently in severe drought conditions. In Morton County, a rural water line trenched in June dug out powder dry soil from eight feet down. Grass seed had no chance of germination, so now the scar left is a trail of nasty weeds, like buffalobur, a nightshade plant, *Solanum rostratum*. (Fig. 4)

Melon hack

Last year, ground squirrels chewed on every cantaloupe in our garden. Videos on the internet had several unique ideas to prevent rodent damage, but all involved a bit too much work, especially with a bumper crop of melons.



Fig. 2. Heavy spring pruning in an overgrown, neglected vineyard yielded fresh new growth. Photo courtesy of Stone Cottage Orchard & Vineyard.



Fig. 3. Grape, Valiant. Photo courtesy of Stone Cottage Orchard & Vineyard.



Fig. 4. Buffalobur, *Solanum rostratum*. Photo courtesy of Cathy Ruebel.

A cheaper and quicker option idea was born at the dollar store with some small wire baskets, just melon sized. The rim was bent in to accommodate the vine, and a few nylon ties secured the two halves around the melon, keeping it safe from a hungry squirrel. (Fig. 5) The melon jail also raised it off the ground and protected it from sitting in moisture. (Fig. 6)

Bird box tenant

In a follow-up from last winter's article in *The Dirt* on building a bird box to attract blue birds, there was moderate success. (Fig. 7) The box was mounted along the fence line. The very next morning, prospective tenants were checking out the new home; it was just right.

No, it wasn't bluebirds - tree swallows, and quite friendly, too. The tree swallow was new to this property, so it was a good outcome. They successfully raised their brood of four and moved on. The bird box is cleaned out and ready for next year.

The killing frost has put an end to the North Dakota growing season, with only the hardiest of plants to keep the show going. Keep track of what went right this year, and moreover, the lessons learned along the way.

Don't forget that garden photos contain valuable information, including dates which can augment your notes. Mother Nature certainly isn't going to present the same challenges at the same time each year, but with hindsight, you can get a step ahead once in a while.



Fig. 7. Blue bird box ready for its next tenant. Photo courtesy of Cathy Ruebel.



Fig. 5. Melon Jail - A dollar store hack to protect growing cantaloupe. Photo courtesy of Cathy Ruebel.



Fig. 6. Melon Jail - Strapping the cage to a trellis or fence can also support heavy fruit. Photo courtesy of Cathy Ruebel.



How to start a new bed without removing sod Fall is a great time to use the lasagna method

By Laura Kourajian, lkourajian@yahoo.com

No-till gardening is becoming increasingly popular for improving soil health and controlling weeds. How about for starting a brand, spanking new garden bed in your backyard?

Consider lasagna gardening, which may also go by other names and decidedly does not involve growing tomatoes and oregano and other ingredients for the popular Italian dish.

My husband and I learned about lasagna gardening about 12 years ago when we overheard a comment made by another attendee at a Saturday morning gardening workshop. It caught our attention because apparently it was a method of starting a new garden area without removing sod or turning over dirt, which appealed to my husband. We were planning to expand a flower bed and this seemed like a good way to start one without removing sod and bringing in new top soil.

We did a little online research and worked out our own version of lasagna gardening,

which turned out beautifully and has resulted in a worm-laden, rich flower bed full of happy perennials (Fig. 4, Fig. 5). The bed lines a chain-link fence separating our yard from the neighbor's and the resulting flower bed, while looking great, means we don't have to mow or trim along the fence.

When we had a fence installed around our yard this spring to keep out the pesky urban deer, it opened up a whole new opportunity to grow vegetables. But to grow vegetables, we'd have to convert the full-sun bed I'd spent years filling with deer-resistant perennials into a vegetable garden, which meant finding space to move all those perennials.

That space existed adjacent to the old bed in an area behind a small island with a linden tree, a lilac bush and a few other plants. This grassy area really served little purpose, so it was perfect expansion space.

Based on our earlier experience, we decided we would employ lasagna gardening



Fig. 1. To start your lasagna garden, it helps to outline the edge of the garden and install a barrier, in this case landscape edging. We also used glyphosate to kill off the grass along the outside edge of the border. You will need lawn clippings or other compostable material like fallen leaves. You will also need old newspapers or newsprint and a ready source of water. (Hint: Use your lawn mower to determine the curve of your bed so the mower will move easily along the curve without having to back up or trim out odd angles or corners.) (Photos courtesy of Laura Kourajian.)

for the expansion.

If you are looking to create a new bed, fall is a great time to employ lasagna gardening as it gives you the winter to let it decompose and you will have great soil to start planting in the spring.

Just like lasagna requires layers of meat, cheese and sauce, our version of lasagna gardening requires layers of newspaper, compostable material and peat moss.

You will need (Fig. 1):

- Enough newspapers to cover the space 3 or 4 pages thick.
- Enough grass clippings, leaves or other compostable material to cover the newspapers.
- Enough peat moss – sedge peat or sphagnum peat work equally well – to cover the compostable material.
- A garden hose to spray down the materials as you add it.

My husband saved newspapers for several months. The newspapers will block out the sun and effectively kill off the sod, which then becomes more compost for your new bed. Soy-based ink is the norm for newspapers, so no need to worry about getting unwanted

chemicals in your new garden. We used the part of the newspaper printed on newsprint (newspaper paper), and discarded anything printed on glossy paper.

Spread the newspapers 3-4 pages thick on the sod, working a small section at a time. It's best to do this during a non-breezy part of the day, but keep a garden hose handy to wet down the newspaper as quickly as you lay it down or the slightest breeze means you will be collecting the newspapers from the neighbors' yards.

Be ready with the grass clippings to cover the newspaper as soon as you've wetted it down. In our case, we used our own clippings from one mowing of our yard, and enlisted a neighbor to give us his clippings at the same time. If you don't have enough clippings or fall leaves to do the entire space at once, it's OK to do it over the course of several weeks each time you mow your lawn.

If you are using grass clippings, ensure they haven't been recently fertilized with a weed-and-feed fertilizer that contains an herbicide. (If an herbicide has been used, wait until the lawn has been mowed at least three times before using the clippings.)

Once the grass clippings, leaves or other

compost is covering the newspaper about 2-3 inches thick (or thicker, if you like), cover the whole works with peat. (Fig. 2, Fig. 3) Whether you use sedge peat or sphagnum peat moss is a personal choice. In our case, we covered with a thin layer of sedge peat and a thicker layer of sphagnum peat moss, which is less expensive and more readily available. You can repeat the compost and peat layers, if you'd like, but we found one layer of each is enough to launch our plants.

Water the whole area thoroughly to get it settled. You may discover small areas where the sod wants to poke through and grow, and you can spot cover those areas or just pull out the sod and let it dry and decompose in the new bed.

There you go! You're done. It's a good idea to water it regularly if there isn't regular rainfall.

You can start planting immediately by cutting or digging carefully through the layers to embed your new plants, or you can let it "cook," essentially letting the sod die off and decompose, as well as the grass clippings/leaves/compost decompose, for weeks, months or over the winter.



Fig. 2. Creating your new bed will involve covering the current turf (under the wheelbarrow) with a layer of newspapers 3-4 pages thick (right, center). This will block out the sunlight and kill off the grass. The next layer (front, right) is grass clippings or other compostable material. And the final layer (left) is peat moss. Here, we used a thin layer of sedge peat which was eventually followed with a heavier layer of sphagnum peat so all of the grass clippings were covered.



Fig. 5. Earthworms are plentiful and the soil is friable in the lasagna gardening bed established 12 years ago without turning a spade or removing any sod.



Fig. 3. My husband, Chad, shoveled the sedge peat over the covering of grass clippings in the new bed area. To the right are pumpkin vines growing into the bed we are expanding.

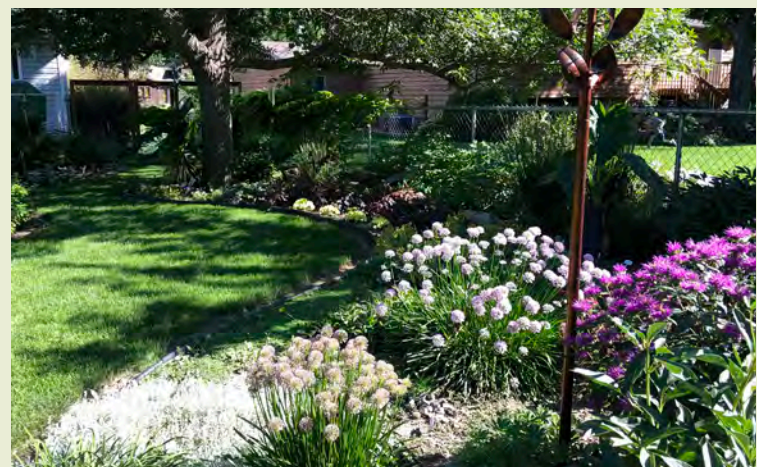


Fig. 4. This bed, running alongside a chain link fence and under an ash tree, was created using lasagna gardening about 12 years ago. Today, it is full of happy perennials, including peonies, monarda, alium, feather reed grass and heuchera.

The New York Chinese Scholar's Garden, part of the Staten Island Botanical Garden, shows intricate stone mosaic pathways, stones and architecture, with trees and plants playing a secondary role.



Classical Chinese Scholar Gardens

Ancient gardens designed to reflect a balanced life

by Anne Blankenship, anne.blankenship@ndsu.edu

Chinese gardens intended for leisure first appeared alongside emperors' palaces but were soon replicated within the courtyards of merchants, civic leaders, and scholars.

These scholar gardens gained popularity during the Tang Dynasty (618-907). Sophisticated gardens became a point of pride for the elite classes as a place where one could write or read poetry, practice calligraphy, paint, play a musical instrument, converse with friends, or sit alone in meditation. A balanced garden was thought to reflect a balanced life.

While small compared to English landscape gardens, the individual elements of a Chinese garden combine to represent grand scenic views that continually change as a person walks along circuitous paths, steps through interior gates, climbs over bridges, or simply sits within a pavilion and watches others interact with the environment.

Chinese gardens are defined by four elements: architecture, water, stone, and flora. Whether in grand and minute settings, these features replicate larger formations like rivers, lakes, mountains, and forests. Ancient traditions suggested the essence of the larger formation could be contained in these miniature forms and allow viewers to immerse themselves in nature, leaving civilization behind.

High walls surround the gardens to block out the conflicts, stress, and tedium of daily life. This experience fosters a central tenet of Daoism that teaches people to separate themselves from society and connect with nature in order to follow the *dao* or the natural flow of the universe. This communion with nature allows a person to balance and refine their inner energy (*chi*).

The balance between the complementary forces of *yin* and *yang* is visually depicted within the garden when the architect harmonizes the placement of spiraling rocks (*yang*) and flowing water (*yin*). Uniform elements like relief patterns on a low wall or mosaic patterns of paving stones complement the garden's cavalcade of abstract forms created by unusual rocks, undulating shorelines, and various flora and fauna.

“A man is known by his garden.”

- A Chinese saying

Architectural elements range from large wooden tea houses, moon-viewing pavilions, and bridges to intricate stone mosaics decorating pathways. Walls separate sections of the garden and complement the beauty they surround, often undulating like a long Chinese dragon.

Each doorway and window frames deliberately designed, picturesque scenes, while latticework casts intricate shadows in the morning and afternoon sun. These views must work equally well in all four seasons and often use distant landmarks to give the impression of being in a larger space. Architects orient a long hall according to the dictates of *feng shui*, Chinese geomancy.

Tai hu, large rocks riddled with abstract hollows made by the erosion of limestone in Lake Tai, are highly prized and prominently displayed in the gardens. Larger gardens like YuYuan, a 5-acre garden in Shanghai, also contain accessible rockeries in which visitors walk through narrow valleys, climb steep paths, explore caves, and view the garden from atop a cliff. These rockeries do a remarkable job replicating the sense of being in the mountains, as you don't know what to expect around each turn.

When constructing the garden, laborers used dirt from what would become the pond to build earthen mounds on which to place the stones to augment the vertical space.

While flora plays a marginal role as compared to its counterparts in European and American gardens, each plant holds symbolic meaning. Gardeners chose peonies for wealth and aristocracy; bamboo for resilience and integrity; pine trees for longevity; and lotus plants for purity and perfection.

A Chinese garden is not grown so much as it is constructed.

The city of Suzhou boasts the most famous scholar gardens, many built by retired government bureaucrats. Civil service examinations in China included sections on music, literature, and poetry, so all government workers were educated in classical arts. The finest gardens in Suzhou, some one thousand years old, are honored as UNESCO World Heritage Sites.

However, you need not cross the Pacific to immerse yourself in a Chinese garden. Teams of several dozen artisans from Suzhou helped build the first Chinese garden abroad in Vancouver, B.C., followed by gardens in Montreal, Staten Island, Portland, Ore., and St. Louis, Mo. The Huntington in San Marino, Ca., is the largest outside of China. These gardens follow the style of classical scholar gardens, but Seattle and its sister city Chongqing are building a Sichuan-style garden in which flora plays a more dominant role.

NDSU Associate Professor Anne Blankenship led tours of the Missouri Botanical Garden's international gardens and teaches about them in her World Religions course at NDSU.



Yuyuan, the Garden of Happiness, Shanghai. Wikimedia Commons https://commons.wikimedia.org/wiki/File:Yuyuan_Garden.jpg



Lion Grove Garden, Suzhou. Wikimedia Commons https://commons.wikimedia.org/wiki/File:20090905_Suzhou_Lion_Grove_Garden_4502.jpg



Fig. 1. Slugs leave a telltale slime trail behind them as they move. When they are disturbed, the slime turns a milky white, as shown here. (Photos courtesy of Laura Kourajian.)

Ugh, slugs.

By Laura Kourajian, lkourajian@yahoo.com

If you haven't had to contend with creepy, crawly, slimy slugs, you are one lucky gardener.

Most North Dakota gardeners aren't so lucky, and as Master Gardeners, you may have been called on periodically by neighbors and friends to identify what's happening to their hosta, which looks like someone shot it full of buckshot, or what's causing nice little round holes in their ripe, red juicy tomatoes.

Such is the work of slugs. Ugh.

Slugs are soft-bodied animals, often described as snails without shells. They have one noticeable upper pair of feelers, which carry their eyes, and one lower set of feelers

used for smelling. They produce slime, and use that slime to move. (When they are disturbed, their slime changes from colorless to milky white.) (Fig. 1)

They range in size from neonate slugs (babies), which are small clumps of slime about ¼-inch long, to adults, which can be up to two inches long. Their color can be dark gray to tan, giving them the perfect cover to blend into the soil that is their home.

They aren't deterred by our North Dakota winters. Slugs live 6-12 months, and are hermaphrodites, meaning each slug has both male and female reproductive parts, so any

two slugs can reproduce.

In the fall, they lay their eggs under plant debris, mulch, boards, rocks or in the soil. The eggs hatch in spring and immediately begin feeding on foliage and fruit. Damage can range from unnoticeable scrapes on fruits to defoliated young plants and large holes in soft-skinned fruits like strawberries and tomatoes. (Fig. 2)

Because slugs have mouth parts that rasp and chew foliage and fruit, the holes they leave behind are irregularly shaped, a tell-tale sign they've been in your garden. (Fig. 3 and Fig. 4) Their numbers increase in shady, moist areas and during periods of rainy weather, and they are most active after dark.

There are a number of ways to control slugs or, at least, reduce their numbers:

- If you're seeing signs of slugs in your garden, use a flashlight after dark to look for them. When you see them, pick them and drop them in a bucket of soapy water. They can also be crushed or sprayed with a 5-10 percent household ammonia solution.
 - You can set traps for these slimy creatures, and then drop them in a bucket of soapy water. We're likely all familiar with the pie
- plate and beer trap: Simply set a pie plate or similar shallow container in the soil so the lip of the container is level with the soil. Fill it with beer or a yeast mixture of 1 teaspoon of yeast to three ounces of water. Some slug species will be attracted to the smell, crawl into the container and drown.
 - Another trap is a simple board, shingle or flat piece of cardboard or heavy newspaper laid on top of the soil. The slugs will gather underneath the board during the heat of the day. When you lift the board, you can pluck the creatures and treat them to the soapy water demise. This will need to be repeated until you no longer see slug damage.
 - Water your garden only when necessary, and water in the morning so plants are dry by evening when slugs are active. Thin or divide plants that are crowded. Trim lower leaves to improve air circulation.
 - Plant plants that slugs don't like: Astilbe, dicentra, lobelia, vinca, viola, phlox, hemerocallis and others are less attractive to slugs.
 - Barriers that keep the slugs away from

your plants are also effective. Copper is effective, and copper rings to go around the base of plants are sold in some garden centers for slug control. Copper pot scrubbers can also be pulled apart and circled around plants. Diatomaceous earth, which is a very fine powder of skeletonized diatoms, can also be spread around plants. The earth has sharp edges that slugs don't like. However, diatomaceous earth is ineffective when it is wet, so may need to be reapplied frequently to be effective. Be careful not to breathe the dust.

- Chemical baits, pesticides and repellents, like Sluggo and Slug Magic, are typically more effective when used in combination with other control methods. Please follow the labeled instructions.

Sources:

Slugs in home gardens; University of Minnesota Extension; <https://extension.umn.edu/yard-and-garden-insects/slugs>

Dr. Rory McDonnell, Oregon State University; <https://agsci.oregonstate.edu/slug-portal>



Fig. 2. Ragged-edge holes in soft fruits and vegetables, like the hole in this tomato, are clear signs slugs have been busy.



Fig. 3 and Fig. 4. Slugs generally do their dirty work at night, but multiple irregularly shaped holes like these in the leaves of lamium (Fig. 3) and hosta (Fig. 4) are evidence of their presence.

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