



# THE DIRT

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## Tree-form Shrubs Gain Popularity

By Laura Kourajian, lkourajian@yahoo.com

Consider the burning bush (*Euonymus alatus*), which puts on its best look-at-me red dress every fall to become a standout in the landscape. It's an attention-getter, for sure. What would it look like if you could raise it up above the surrounding vegetation to bring not only fall color but add height to a corner of your garden that is lacking both? Ah, now we have that colorful shrub on a pedestal. Such shrubs, grafted to a standard (trunk), are often called tree-form shrubs, standards or dwarf trees, and their popularity has grown in the past 20 or so years.

Many homeowners and landscapers have turned to tree-form shrubs to add height, color and interest to their yards and landscapes. Tree-form shrubs are ordinary shrubs that have either been grafted to a "standard," a single trunk, or have been pruned and trained so one branch of the shrub becomes a trunk. The result is a shrub sitting atop of a trunk, like a flag on a pole, usually reaching a height of six feet or so.

How did the idea of raising a bush above its hug-the-earth lifestyle get started? We don't know that, but it seems it's been around for about a generation. "I've been seeing these out there for at least 20 years, particularly lilacs," Esther McGinnis, extension horticulturist at NDSU, said. "I think the first one I saw was a lilac in our neighborhood."

Casey McCollum, the assistant manager at Bergen's Plant Perfect in Bismarck, agreed. He

said the idea of a tree-form shrub likely started with a dwarf Korean lilac before spreading to a few spruce varieties. "Now, there's just about everything being put on a standard," he said, including hydrangeas (Fig 1), ninebarks, evergreens, arborvitae, roses, burning bush and more. From a design perspective, the tree-form shrub is best suited as a specimen tree, standing alone as a focal point in the landscape. "What we see here," McCollum said, "is people looking to add height in their landscapes." They want a tree, but not necessarily something overly huge, and they're looking for a bloom of some sort. "The nice part about them is they can be planted closer to a home, where a larger tree won't fit because of their roots," he added.

Tree-form shrubs are not a no-maintenance plant. Proper pruning is essential to keeping them healthy. "People need to remember the stem portion is a different cultivar (than the canopy)," McGinnis noted. "You need to make sure it's not going to start sending forth shoots. That will compete with the shrub on top." If the sucker is left to grow, it will also look different from the shrub because the root stock is a different genotype and it may grow faster than the shrub, McGinnis said. Likewise lateral shoots coming from the standard, or trunk, need to be cut back.

For the shrub itself, it's important not to shear the canopy into a nice, round globe shape. Doing that, McGinnis said, produces dense growth around the exterior of the

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canopy, spurred by the pruning, that shades everything underneath, resulting in the inside branches dying out. The best way to prune is like you would with a regular shrub – making thinning cuts that keep air moving through and allow sunlight into the inside branches.

Be sure to prune at the time of the year appropriate for the shrub that sits atop the standard, too. For instance, for lilacs, forsythia, viburnum and other shrubs that bloom on the previous season's growth, the pruning should happen immediately after the blooming period has ended. NDSU Extension has a publication, No. H1036 "Basic Guidelines for Pruning Trees and Shrubs," that can be helpful and is available online at <https://www.ag.ndsu.edu/publications/lawns-gardens-trees/basic-guidelines-for-pruning-trees-and-shrubs>.

Tree-form shrubs, while diminutive in size, are not so small in price, owing to the amount of time it takes to get it grafted, healthy and



*Fig 1. Hydrangeas have become an increasingly popular shrub to graft to a standard, or trunk, creating a tree out of a shrub. Tree-form shrubs do best as a specimen planting, creating a focal point. Here the small tree steals the focus and softens the corner of the garage.*

growing before moving it to the retail center. Though some tree-form shrubs may be priced a little lower, expect to pay \$100-\$200 per standard. Like all young trees, tree-form shrubs benefit from support for the trunk during the first growing season or two, and trunks should be protected from hungry rabbits and other varmints during the winter.

The following is a list of many of the tree-form shrubs that are hardy in Zones 2, 3 or 4. Retail nursery centers throughout North Dakota carry a selection of these varieties as they have become more popular in home landscapes.

### **Caragana**

- Caragana arborescens* 'Pendula'
- Caragana arborescens* 'Walker'

### **Burning Bush**

- Euonymus alatus* 'Compacta' (Burning Bush)

### **Ginkgo**

- Ginkgo biloba* 'Pendula'

### **Hydrangea**

- Hydrangea paniculata* 'Pinky Winky'
- Hydrangea paniculata* 'Limelight'
- Hydrangea paniculata* 'Pee Gee'
- Hydrangea paniculata* 'Pink Diamond'
- Hydrangea paniculata* 'Quick Fire'
- Hydrangea paniculata* 'Vanilla Strawberry'

### **Larch**

- Larix decidua* 'Pendula'
- Larix eurolepis* 'Varied Directions'
- Larix kaempferi* 'Diana'

### **Flowering Crabapple**

- Malus* 'Coralcole'
- Malus* 'Lancelot'
- Malus* 'Lollipop'
- Malus sargentii* 'Tina'

### **Mulberry**

- Morus alba* 'Chaparral'
- Morus alba* 'Pendula'

### **Colorado Blue Spruce**

- Picea pungens* 'Globosa'

### **Roses**

- Rosa* 'AC Navy Lady'
- Rosa* 'Campfire'
- Rosa* 'Morden Snowbeauty'
- Rosa* 'Morden Sunrise'
- Rosa* 'Never Alone'
- Rosa* 'Pink Knock Out'

### **Willow**

- Salix caprea* 'Pendula'
- Salix purpurea* 'Pendula'

### **Lilacs**

- Syringa meyeri* 'Palibiniana' (dwarf Korean)
- Syringa microphylla* "Superba"
- Syringa patula x macrophylla*
- Syringa vulgaris* 'Beauty of Moscow'
- Syringa vulgaris* 'Sensation'
- Syringa* 'Tinkerbelle'
- Syringa x hyacinthiflora* 'Pocahontas'
- Syringa x Penda* (Bloomerang lilac)
- Syringa juliana* 'Hers'

# Dig In! Exploring Gardening Podcasts

By Martha Willand, [marthawilland@hotmail.com](mailto:marthawilland@hotmail.com)

One are the days that families would sit huddled around the radio listening to their favorite entertainment programs, but today one can find thousands of programs available twenty-four hours a day online. Podcasts are the equivalent of old-time radio programs, but they are available on the internet for downloading, live-streaming, or they can be heard through various podcast phone applications. There are over 100,000 niche podcasts available ranging from cooking shows to comedy, politics, news, and you guessed it...gardening! We all have moments when we're doing menial tasks such as washing the dishes or weeding, so why not tune into a gardening podcast and learn from others in an entertaining manner?

There must be thousands of gardening podcasts available online, but I certainly didn't attempt to listen to that many. After reviewing some of the most popular gardening podcasts, I have selected six that will hopefully appeal to Master Gardeners in the Midwest. Many of these podcasts also have additional valuable information on their websites so be sure to check those out as well.



## Plantrama

### Science, Art and Dinner: It's all in your backyard.

[www.plantrama.com](http://www.plantrama.com)

These enthusiastic and fun hosts enjoy talking about plants in a personal and conversational manner, and are well-versed in both cultivation and in foraging plants. Ellen Zachos (Fig 1) is a garden writer/photographer, and lectures at flower shows and for garden clubs. She is also the author of 7 books, is a former Broadway performer and Harvard graduate. C.L. Fornari (Fig 1) is an avid gardener, and has also authored 7 books. The two have been hosting their weekly podcast since 2016, and have many recipes posted on their website including cattail souffle, chickweed cocktails and dahlia tuber bread.



Fig 1. C.L. Fornari and Ellen Zachos hosts of the podcast Plantrama. photo courtesy of Plantrama.

## EcoBeneficial

### Useful Landscape Tips to Improve Our Environment.

[www.ecobeneficial.com](http://www.ecobeneficial.com)

Host Kim Eierman is an Environmental Horticulturist specializing in ecological landscapes and native plants. Based in New York, Eierman teaches at the New York Botanical Garden, Brooklyn Botanic Garden, The Native Plant Center in NY, Rutgers Home Gardeners School and several other institutions. Eierman interviews foresters, consultants, professionals and authors with a focus on sustainability, best practices, wildlife benefits, invasive species, eco services and native plantings. Her website provides articles, videos and podcasts ranging in topics from beekeeping to rainscaping and stormwater management.

## In Defense of Plants

[www.indefenseofplants.com](http://www.indefenseofplants.com)

If you love diving into the science, chemistry, biology and evolutionary history of plants then this is the podcast for you. The host, Matt, is a current PhD student who is "obsessed with the botanical world," and he shares his enthusiasm through interviews with fellow graduate students, research scientists, and professors from around the world. Topics range from manzanitas to prescribed prairie fires, soil carbon cycling, and the evolution and ecology of oaks. This podcast is full of experts that will summarize journal articles and academic research in a manner that is entertaining for everyone (Fig 2).

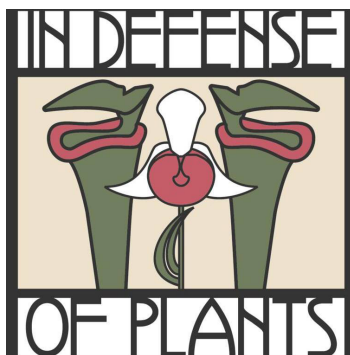


Fig 2. Photo courtesy of In Defense of Plants.

## You Bet Your Garden

[why.org/programs/you-bet-your-garden](http://why.org/programs/you-bet-your-garden)

[www.facebook.com/YBYGwithMike/](https://www.facebook.com/YBYGwithMike/)

This weekly show is recorded and aired on Philadelphia public radio station WHYY, and is hosted by Mike McCrath (Fig 3), former editor for Organic Gardening and Men's Health magazines. If you ever found yourself listening to Car Talk despite a lack of interest in mechanics, then McCrath is your gardening entertainment equivalent. He has a big East Coast personality that overflows with laughter, and a love of organic gardening. In addition to covering practical topics such as pruning winterberries, best practices for ornamental grasses and tips for composting, he also fields questions from the public through emails, letters and phone calls. If you would rather see him in action, you can also catch him on his television show of the same name on PBS online, or on his youtube channel.



Fig 3. Mike McCrath host of the podcast You Bet Your Garden. Photo courtesy of Mike McCrath.

## Slow Flowers

[www.debraprinzing.com/category/slow-flowers-podcast](http://www.debraprinzing.com/category/slow-flowers-podcast)

Debra Prinzing challenged herself to create a locally-grown bouquet for 52 weeks going beyond flowers to include twigs, foliage, dried pods and more. Through this experiment she realized we could place a greater focus on seasonal and regionally produced flowers as opposed to importing blooms from afar. Just as the slow food movement has changed the relationship between many consumers and their food, Prinzing hopes to inspire others to consider sustainable seasonal flowers and plant materials when making arrangements. With a background in textiles and design, Prinzing has a rich artistic perspective which is evident on her website with her extensive design tips, bouquet "recipes" and regional floral ingredients lists. Her podcasts include interviews with flower wholesalers, floral artists, flower farmers and herbalists.

## The Plants We Eat

[gardens.uncc.edu](http://gardens.uncc.edu)

This is the podcast for those that have an interest in the history and anthropogenic uses of plants. Produced by Jeff Gillman, Director of the University of North Carolina Charlotte Botanical Gardens, and plant expert Cindy Proctor. The two discuss unique facts about the plants we interact with through our lives; how they can intoxicate, cure us of disease, nourish and even kill us. Each episode focuses on a different plant spanning from sassafras, mustard, and cattails to rutabaga. This podcast will increase your random and eclectic plant knowledge, and is perfect for those that enjoy the cross section of social science and plant biology.

# Construction of a Hobby Greenhouse/Solarium

By Barbara Garceau, garceau@utma.com

November 15, 2018

We had been thinking about building a new greenhouse attached to the house for a couple of years. The failure of panels in the current greenhouse as well as the deterioration of the remaining panels and the loss of the door made this the year for it to happen. (Fig 1)

My husband and I started the project in August 2018 with the decision to attach the structure to the north end of the garage. A large window was located on the west side of the garage in what we call the "Barbie Shoppe," my work area. By removing this window we were able to install an access door and a new smaller window so my cats can still enjoy the view. (Fig 2)

## We faced several problems:

**Problem 1:** When we went to the lumber yard to order rafters, we were informed that the wait time would be 3 weeks or more.

**Solution 1:** We decided to build our own. The problem is that we have never built rafters; we've built 5 different structures but always ordered prebuilt rafters.

Building rafters: A list of several of the Youtube videos that I watched is included at the end of this log. This is not a finite list but ones where I borrowed ideas from the video. Also, after we had drawn up our building and rafters, we visited with a local carpenter to make sure we had everything covered. He told us that we might be actually "over-building" so things should be definitely solid. Things I learned were:

- The full use of the speed square and the framing square. Before I had basically used them for drawing straight lines and right angles. They can both be used for figuring rafter pitch. The framing square also has a chart which gives the length of the rafter leg once you know the pitch and the width of the structure. This feature really helped with planning lumber purchases.
- The importance of a framing jig. I could not include the title of this video because I was not able to find it again. The young man in the video was building his own garage and had built his jig out of lumber and laid it out on the floor of the structure. We were building our rafters in the farm shop which has a concrete floor so we had to improvise. We used a marker and drew out the jig for the rafters on the floor and then laid our rafters out on top of the diagram.
- The importance of a pattern piece. After the first leg was designed and cut, it became the pattern for the rest of the legs. This made the rafters all the same.
- The purpose of the bird's mouth and how to construct one.
- The differences between steel and wood gussets. While steel gussets are quick and easy to use and readily available at lumber yards, the wood gusset and glue is still the preferred choice.

**Problem 2:** We would be working with 2 different roof pitches, a 1-12 pitch on a 3 foot walkway connecting the garage and the



Fig 1.



Fig 2.



Fig 3.

greenhouse and a 5-12 pitch on the 16 foot long greenhouse section. How do you connect the two?

**Solution 2:** Browse Youtube. Find out how to build a transitional rafter.

Transitional rafters: I could not find any videos on building rafters to transition between two different pitches or ceilings. However, I did find several pictures of that type of rafter. I also had seen one once before; Gary's brother and his wife had that type of rafter in their lake

cabin where the kitchen went from a flat roof to a vaulted roof over the dining area. What we did was build another of the 1-12 pitch rafters and then incorporate it into the final 5-12 rafter. It might not be quite how a carpenter would have done it but it looks like it will work. (Fig 3)

**Problem 3:** We wanted lots of windows but windows are expensive.

**Solution 3:** The local lumber yard had a bunch of windows from a construction site in Minot; the windows had been judged not up to contract specs and so they had been sold for a fraction of their cost. However, the windows were vinyl which we had never worked with. Installation left several problems and one window was broken during installation. How do you finish these windows off and how do you fix the broken one?

Vinyl windows come with their own set of problems:

- a. We learned that these windows where the nailing flange is extruded right along with the frame can have extra vinyl in places where it becomes a problem. We ended up removing screws and trimming vinyl many times during the installation. We also found some more areas where we had to remove the sealing tape while putting the siding on and trim more vinyl because the siding wouldn't lie flat. Careful preparation of these windows became very important.
- b. While the windows were still lying on the trailer, my husband leaned across one of them to reach another window. The vinyl flexed; the glass didn't. Oops. Now what do we do? We went back to see Charlie at the lumber yard. He took us to the supply room and showed us how to remove some flanges and get to the glass and replace it.
- c. These windows come with only a 2 inch frame and no channel to insert a panel into like I am used to. Right now I am working on custom cutting vinyl board to make frames for them.

**Problem 4:** The electricians informed us that if we considered this structure a greenhouse, it would have to meet greenhouse code. This would mean an external grade breaker box (expensive), all wiring run in conduit (expensive and ugly), and sealed light fixtures (expensive but funky).

**Solution 4:** The greenhouse became a solarium, a sunroom, three-season room, party room. (Fig 4) The electricians agreed that having to follow code was not necessary because of the way this room would be used. It will only have plants growing in it for 3 months of the year. (Fig 5/Fig 6) There will be no overhead watering system. They finished the rough-in wiring yesterday. It is ready for foaming.

**Problem 5:** Our old greenhouse had taught us how fragile the early polycarbonate panels were. What kind of material could we put on the solarium which would last and handle the elements North Dakota sometimes throws at us?

**Solution 5:** We decided to continue with polycarbonate panels. The job now was to select the best panel. Who knew there were so many companies and so many different products out there with each one claiming to be the best?

Polycarbonate Panels: We did lots of talking. We talked with a contractor at the state fair in Minot who builds hobby greenhouses



Fig 4.



Fig 5.



Fig 6.

similar to the one we were thinking about. He builds them with the upper half of the walls and the full roof in panels. He explained that Menards carries the panels and other materials in stock, so we went to Menards. There we met a wonderful young man named Eric Hanson; he is the assistant manager in the Building Materials department. He showed us what Menards carries and told us that there were more items available online. He also gave us some brochures on the materials which are made by the Amerilux Corporation. We also visited with my sister and her husband who had built a lean-to greenhouse on the south side of their house about 3 or 4 years ago. We learned...

- a. Proper installation is critical. My sister and her husband fought with drips along the seam where their greenhouse was connected to the original house for years. They just finally got the

problem fixed last year so they were finally able to begin working on completing the interior. So we turned into pests, asking lots of questions about installation.

- b. We spent lots of time at [Ameriluxinternational.com](http://Ameriluxinternational.com) researching the products. We also visited [Menards.com](http://Menards.com) and found several different thicknesses of panels. Our old greenhouse had a 2-wall construction, 8 mm thick, which was a very poor insulator. Also hailstorms did a number on it no matter the size of the hail. My sister has a 5-wall, 25 mm, panel made by Polygal company. It is much stronger and a much better insulator. Lo and behold, Menards had a 25 mm 5-wall product called Lexan Thermoclear 15. We decided that is what we wanted, so we went to Menards to order it. Eric helped us again. We could order the panels but we couldn't order the U and H channels to install it. We put everything on hold.
- c. The next day I called Amerilux just outside Green Bay, Wisconsin, and asked if there was someone I could talk to about the Lexan panels. I was directed to a wonderful person named Stephanie Bitzan. Stephanie told me that the 25 mm panels are not intended for greenhouses but they can be made to work. They have to be installed with aluminum framing members rather than polycarbonate. They also do not have the anti-condensation coating on the interior like the 8 and 16 mm panels do. She explained the difference between the thicknesses based on the u and r values of the panels; there was actually not a whole lot.
- d. The next day I received an email from Stephanie explaining what the cost of the Lexan 25 mm panels and the necessary aluminum elements to install them. She also sent a 16 page installation guide and an 11 page framing guide. I learned that the panels are made for a 49 inch on center installation. We had placed our rafters in the standard 48" pattern so we had to revamp 3 of the rafters. Information for figuring wind and snow load as well as supplemental blocking between the rafters was also included.
- e. I also found the address for the parent company on the Lexan film covering the panels. The company, which is headquartered in Saudi Arabia makes the resin for all these polycarbonates. Their website includes all the resins and the different specifications of them—from flexibility to strength to color to reactivity, etc.
- f. We decided to go with the 16 mm Lexan Thermoclear 15. Stephanie told me that they could send it cut to exact lengths; this was important because it is sold by the square foot. If ordered from Menards in the standard 8 foot lengths which would have to be trimmed to 6 feet, we would be paying for 8 square feet per panel which would just be thrown away. She told me to call Menards and order it. Give Eric her name, the Amerilux phone number, and her extension and she would talk him through the process of doing the special order. We were underway.

**Problem 6:** We had thought that we would not need to include a ventilation system since we had so many large, opening windows. However, we were advised to include ventilation for several reasons. The problem was that we didn't know what size fan we would need. Would it fit in the gable end wall, the only area where we could possibly put it?

**Solution 6:** [Greenhousecatalog.com](http://Greenhousecatalog.com) answered all our questions. Still a problem. We found an excellent site at [greenhousecatalog.com](http://greenhousecatalog.com) which explained the importance of ventilation including pest control and pollination for self-pollinating plants like tomatoes. The site also included information on figuring CFM (cubic feet

per minute) of the greenhouse which would be the minimum size of fan needed and then how to calculate the optimum size of fan by multiplying the CFM by 1.5. Now we are researching the fans available to find one that meets our size needs, is dependable, and will fit in the space we have to work with.

### People sources for information:

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- a. Larry Haas, carpenter, St. John, ND
- b. Charlie Okerson, Building materials consultant, Munro Builders, Rolla, ND
- c. Eric Hanson, Asst. manager—Building Materials, Menards, Minot, ND
- d. Stephanie Bitzan, Customer Relations Manager, Amerilux International, De Pere, WI

All of these people were fantastically helpful. Eric and Stephanie were outstanding. What a joy to work with people like those two.

### Websites:

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[www.Ameriluxinternational.com](http://www.Ameriluxinternational.com)  
[www.menards.com](http://www.menards.com)  
[www.greenhousecatalog.com](http://www.greenhousecatalog.com)  
[www.backwoodshome.com/five-building-tips-for-super-strong-framing](http://www.backwoodshome.com/five-building-tips-for-super-strong-framing) This was the source for our information on constructing gussets for the rafters.  
[www.sabic-ip.com](http://www.sabic-ip.com)

### Youtube Videos:

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Where possible, the name of the person or company which produced the video is included. Length of the video is included.

1. "How to Build a Shed: Building and Installing Roof Rafters." 6:04
2. "Training the Trades: Cutting Common Rafters." Toolbelt Pro TV, 35:12
3. "How to Build a Lean-to Shed: Part 4—Rafter Build." iCreatables, 7:01
4. "DIY Roof: Rafter's Bird Mouths." Carl Rogers, 10:37
5. "Cutting and laying Rafters for the Vaulted Roof." Bob Vila, 4:57
6. "How to Frame Roof Rafters & Tips." CoKnowPro, 10:43
7. "How to Cut a Roof Rafter." Aaron Friend, 12:28
8. "Framing Square Pro Tips." Essential Craftsman, 15:02
9. "Framing Square Basics." MakeBuildModify 15:27
10. "How to Measure Roof Rafters Including the Pitch and Bird's Mouth Cuts." ACCBCT, 18:18
11. "How to Calculate the Length of Roof Rafters." ACCBCT, 18:18
12. "The Basics on a Speed Square." Classic Work, 9:06
13. "Framing Rafters with Speed Square." Classic Work, 10:25
14. "Calculating Rafter Length." Pete Donnelly, 9:15

*This is the first in a two part series on the Garceau solarium. This first part informs of the decision to build and the problems/solutions encountered. The second part which will be published in the next newsletter will have a timeline/photos of the construction process.*



# Do Blue Hydrangeas Make Us Sing the Blues?

By Esther McGinnis, NDSU Extension Horticulturist, [esther.mcginnis@ndsu.edu](mailto:esther.mcginnis@ndsu.edu)



Fig 1. The captivating blue flowers of an 'Endless Summer' hydrangea. MJJR [CC BY 2.5 (<http://creativecommons.org/licenses/by/2.5/>)], via Wikimedia Commons.

**N**orthern gardeners frequently fall for the allure of a periwinkle blue hydrangea. Of all the colors in the garden, blue seems to excite the most interest because of its rarity. As a result, gardeners flock to the nursery to buy this captivating but problematic hydrangea.

Blue hydrangeas belong to the species *Hydrangea macrophylla* and the common name is bigleaf hydrangea. One of the most popular cultivars of this species is 'Endless Summer' (Fig 1). This cultivar gained popularity because of its ability to bloom on both old and new wood. If a plant blooms on old wood, this means that flower buds are initiated in late summer or early fall for bloom the following year. Conversely, if a plant blooms on new wood, the flower buds are initiated the year it blooms on new twig growth.

While this hydrangea cultivar looks healthy and vigorous at retail, the shrubs struggle in the North Dakota landscape despite the ability to bloom on both old and new wood. In many years, low winter temperatures and late spring frosts kill the flower buds that were initiated the previous year. While the shrub may not be killed, there will be a significant delay in flowering until the new growth (new wood) produces flower buds. In reality, this may mean that blooms are not produced until late summer or early fall. This is hardly a full summer of blooms!

Another problem is that it is difficult to maintain the periwinkle blue color over the course of many years. *Hydrangea macrophylla* aficionados know that blue flowers are produced under acidic conditions ( $\text{pH} < 5.5$ ) and pink flowers are produced in neutral to alkaline soils ( $\text{pH} > 6.5$ ). Purple flowers occur at intermediate pH levels. Many gardeners will add sulfur to lower the soil's pH at planting. While this soil amendment may work for the first couple of years, the shrub will eventually transition first to purple and then finally to pink flowers. This phenomenon can be explained by North Dakota's soils. The soil for most of the state is highly alkaline. Consequently, the soil will resist long-term efforts to change the soil pH.

As the flowers start to turn pink, some gardeners will attempt to remedy the situation by adding acid-based fertilizers to restore the blue color. However, over-application of these fertilizers can result in root rot that may harm or kill the shrub.

Undoubtedly, a small minority of 'Endless Summer' shrubs are doing well in North Dakota. These shrubs are most likely planted in sheltered microclimates and potentially mulched in late fall to protect the old wood. In addition, these shrubs are more likely to be planted in a loamy as opposed to heavy clay soils.

In the next edition of *The Dirt*, we will cover *Hydrangea paniculata* cultivars that are a wonderful replacement for *Hydrangea macrophylla*.

# Simple Water Features from Found Items

By Corinne Frey, [vcfrey@yahoo.com](mailto:vcfrey@yahoo.com)

**W**hat do your Grandma's tea kettle, an old cream can, clay pots, a whiskey barrel, and a cupola have in common? They can be used to create simple, inexpensive water features in your yard. The sound of running water is soothing for humans, and a great place for pollinators and other critters to get a drink or take a bath. If your yard is too small for a pond or larger water feature, or if you are just getting started, a simple set up from found items is a good place to begin. They can be as simple or complex as your creativity will allow, but one thing is constant...recirculating water has to return to the container where it started (wherever the pump is located).

To keep your expenses down, look for old kettles, buckets, cans, clay pots, etc. Make sure they have not been used for chemicals or petroleum products, and that they will

fit your designated location. The selected area needs to be close to an electrical outlet, as extensions cords are not recommended. Always consider safety, with extra diligence concerning children and pets. Objects do not necessarily have to be water tight. Small holes can be sealed with aquarium sealant, or the object can be placed so it drips back into the pumping area. In lieu of purchasing pond liner for smaller projects, objects can be lined with contractor garbage bags and secured with multiple magnets or rubber bands. For best results, use two contractor garbage bags, and trim to fit. Another way to save on the cost of a pond liner, is to use an old cooler or a Rubbermaid tub. The Rubbermaid brand of tub holds up much better than hard plastic, which tend to crack or break. To help prevent collapse of the tub, dig the hole just large enough to hold it. Cut holes into the lid so tubing and electrical cords can come out, and water can return. Check to make sure whatever you place on top of the lid will not crush the tub, or drip water over the edges. Note — the larger the container holding the pump and water, the less often you will need to refill it.

The simplest type of water feature is a recirculating pump placed in a container of water. An example of this type, would be a half whiskey barrel with a plastic preformed liner, and a pump that sprays or bubbles water above the surface, and then the water falls directly back into the container. Any container that holds water could be used in this manner (washtub, bucket, flower pot without drain holes, etc). Place the pump in the bottom of the container, fill with water, and plug in the pump. In a matter of minutes, you will

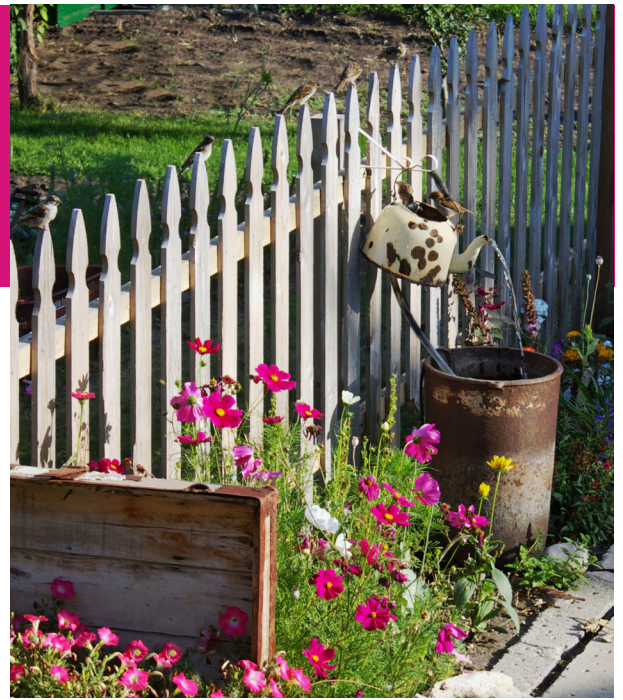


Fig 1. Five birds wait their turn to get a drink from "Grandma's tea kettle", while two others enjoy the splashing water (photo courtesy of Corinne Frey)



Fig 2. Water bubbles out of the top of an old cupola, washes down the sides, and seeps back into the pond liner where a pump repeats the process (photo courtesy of Corinne Frey)

have a water feature. A resting area just above the surface of the water will help encourage insects and birds to utilize the water. Flat rocks work well, or a thin wire or fishing line can be stretched across the top of the container. It's important to keep water moving and fresh so mosquitoes don't lay eggs.

If you would like the water to pass through one or more containers/objects, the top most object needs to be connected to the pump tubing, and then spill into additional container(s). An example would be a large "pot" that contains a pump and water. The pump that has been placed in the bottom of the water filled pot could be attached to "Grandma's tea kettle" (Fig 1) with tubing leading directly from the pump, and pushed through a hole in the underside of the kettle. As the water pumps into the kettle, it pours through the spout and back into the source of water. The large cast iron container pictured did not have a bottom when it was found. To hide the broken bottom, it was dug about twelve inches into the ground, then lined with two contractor garbage bags secured with magnets, before it was filled with water. To prevent leakage from the underside of the tea kettle, aquarium sealant was put around the edges of the tubing and allowed to dry completely before water was turned on.

A cupola (Fig 2) that belonged to my parents has also found a place in our yard as a water feature. It has been a favorite of the robins who nest nearby. A three to four foot deep hole was dug, and then a pond liner that extended



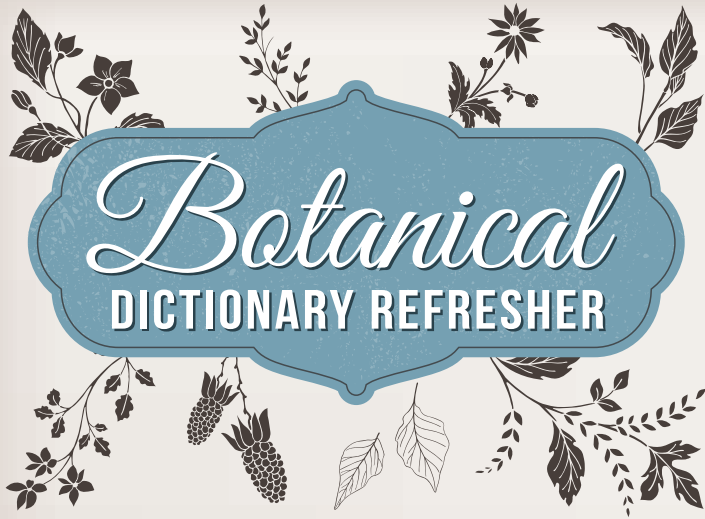
approximately one foot beyond the widest part of the cupola was placed in the hole. The excess liner that goes past the edges of the cupola, ensures that water will be caught and guided back into the hole. A pump was placed in the bottom of the liner, and the electrical cord was trailed near the foundation of our home. To keep prongs dry and to prevent shock, make sure your cord end is protected by a cover, and the outlet has a ground fault circuit interrupter. A piece of tubing long enough to reach the top of the cupola was attached to the pump. The tubing was then cable tied in several spots to a closet rod that rests in the middle, reaching just below the top surface of the cupola. The cable ties need to be tight enough to hold the tubing, but should not pinch it closed. The cupola was then placed over the hole, and a variety of stones were placed around the bottom to camouflage the pond liner. Water bubbles out of the top of the cupola, runs down the sides, and seeps past the rocks back into the pond liner. The hole can be filled with water by laying a hose in the rocks.

Some water features appear complicated, but are quite simple. Even though water rushes out of the faucet on the whiskey barrel (Fig 3), the inside of the barrel is completely dry. A 6 inch x 6 inch hole was cut in the side of the barrel. The tube attached to the pump in the water below was then pulled through the hole and secured to the faucet with a coupling. Water runs out of the faucet into a half barrel and spills back into a pond liner, ready to circulate again and again. The old pitcher pump in the background has its own recirculating pump, but the two features share the same water. Tubing from the recirculating pump hidden under the barrel was threaded through the pitcher pump so water could splash down the rocks.

Remember, the possibilities for water features are endless, and only limited by your creativity. A simple set-up from found items is a great way to start, and you will learn something new each time you make one, soon realizing that one thing is always the same...recirculating water has to return to the container where it started.



Fig 3. Even though water rushes out of the faucet on the whiskey barrel, the inside of the barrel is completely dry (photo courtesy of Corinne Frey)



By Lila Hlebichuk, [lilahl@yahoo.com](mailto:lilahl@yahoo.com)

This issue will focus on the vascular system inside plants where water, food and minerals are transported through duct-like cells.

**Vascular** - Derived from the Latin vasculum, little vessel.

**Vascular bundle** - A strand of conducting tissue containing xylem and phloem. These vital tissues form pipelines of fluid transport connecting leaves, stems and roots.

**Xylem** - Large, water-conducting cells toward the inner half of the vascular bundle which transport water and nutrients from the roots to the shoots, leaves and above-ground parts.

**Phloem** - Smaller, food-conducting cells toward the outer half of the vascular bundle which transport sugars manufactured in the leaves to the roots and other parts of the plant.

**Vascular cambium** - A single row of cells; the meristematic tissue between the xylem and phloem.

**Meristem** - A region where cells actively divide.

**Angiosperm** - A class of plants characterized by the formation of flowers and seeds in fruits.

**Cotyledon** - A food storage structure in seeds.

**Dicot** - A subclass of angiosperms with two cotyledons in the seeds.

**Monocot** - A subclass of angiosperms with one cotyledon in the seeds.

**Herbaceous** - A plant that does not have woody tissue and dies back to the ground in the winter in colder climates. Herbaceous plants either lack a vascular cambium or have a lateral meristem that remains inactive.

In dicots the xylem and phloem are arranged in a ring allowing for the stem to grow in girth. In monocots the vascular system has conducting tubes scattered throughout the stem.

The vascular cambium also separates the cortex and pith in the areas between the bundles. When these cells divide laterally (toward the side) they result in an increase in the stems diameter during secondary growth processes. Early in the development of many perennial species, activity in the vascular cambium changes their stems from herbaceous to woody structures.

#### Sources:

Botany for Gardeners by Brian Capon  
Garden-pedia by Pamela Bennett and Maria Zampini

# The Green Gym

By Cathy Ruebel, [Foxtail2400@gmail.com](mailto:Foxtail2400@gmail.com)

**F**ull-fledged springtime is here! After a very long winter, nothing charges the gardener's soul like a great forecast and the garden centers bursting at the seams with colorful rainbows of plant life. There's all the nifty gadgets and vignettes we could only daydream about just a couple months ago. A great workout in Mother Nature's Green Gym promises lots of cardio and strength exercise with no membership fees. Hours pass by without a notice as the beauty of your garden unfolds.

Before we charge outdoors, let's pause a moment to consider preparation, maintenance, and smart use of the most important component of any beautiful and successful garden: YOU. Raise your hand if you would confess to a marathon effort in the garden, only to be semi-immobile the next few days by painful muscles and joints, or a bad sunburn. Keep these tips in the back of your mind each time you head into your garden, even if to just touch up a small patch.

As always, consult your doctor before starting any exercise program, especially after a long winter. Gardening can be a deceptively intense workout. Remember to do some stretching exercises to get your muscles warmed up to increase your flexibility. Start slowly with twenty or thirty minutes and work up to the all-day marathon. Digging, raking and hoeing and weeding are high intensity workouts (remember the gym lingo?). Going at it for hours on end to get a job done will promise angry muscles and joints, or even serious damage. Switch off tasks frequently. Lift wisely – remember to use your biggest muscles to lift. Better yet, enlist a helper to move heavy, bulky or awkward items.

Take a break and drink water frequently – carry it with you. If you think you are thirsty, get a drink. It's your body's subtle message that it needs more water to counteract what your body is using, especially on warm, sweaty days (Fig 1).

Gear up. Start with a good sunscreen and remember to apply it as directed on the package, as it will wear off after time, especially if you sweat it off. A wide brim hat will help you ward off the effect of a strong summer sun. There's sport clothing available rated with a UV factor like sunscreen, which can add a fashion element to your gardening attire. Wood ticks, mosquitos and biting flies are the unpleasant side of getting down and dirty. Insect repellent will help to keep the pests at bay. Those who have allergies generally know how and when to protect themselves, but did you know you can develop allergies at any point in your life? Dust and allergen protection – clothing, face masks, even filtered respirators can expand your active time in the garden. Find some good gloves appropriate to the task at hand, such as rose gloves or rubber gloves when dealing with chemicals. Replace gloves when they are wearing out. There's even gloves with reinforced fingertips to better protect your manicure.



Fig 1.



Fig 2.

The right tools for the job can make a world of difference. Even well-toned muscles can be damaged, and the healing process will take much longer when inflicted. Knee pads and wrist braces can protect sensitive joints from further abuse. Ergonomically designed hand tools, such as trowels, forks and shovels help to keep better alignment in your arms and wrists (Fig 2). Raised beds and planting boxes can bring gardening up to a better level for mobility impaired gardeners. The most important tool in the garden is your judgment - know when to take a break, stay hydrated, raise the white flag when overwhelmed, and call in reinforcements or the Big Iron.

Ok, can I "walk the talk"? I try. I have learned the hard way why these tips are good practice, yet I forget at least once a year. Protective gear and good tools are second nature due to allergies and aging joints. The weakness comes when my need to rest doesn't match someone else's stamina, or "gotta get it done" boxes me into a corner. I need to constantly remind myself to take a break. Make the most of the beautiful days in your Green Gym, because we know for certain what follows in North Dakota – the White Gym.

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