



# Daydreaming of a Water Garden

By Cathy Ruebel, [foxtail2400@midco.net](mailto:foxtail2400@midco.net)  
with Peg Boe and Kathleen Wiese, contributors



Fig. 1 photo courtesy of Kathleen Wiese

**W**ater gently cascading amongst the garden greenery can soothe even the most anxious of souls, so it's no small wonder that garden water features are ever increasing in popularity. After a viciously cold winter in North Dakota, who couldn't use a calming escape? Hmm...how about a pond (Fig. 1)? With a stream and waterfall? Or maybe a pondless cascade? Now is a great time for research, planning and making notes.

Safety should always be the first consideration. It doesn't take much water to pose a drowning hazard to small children and even pets. Pondless water features can provide an alternative to open water. Take advantage of natural sloping or swales. A wet location could provide an ideal use of the area.

Electricity needs to be available to run pumps, aerators, lights, etc.

Size is directly proportional to cost and maintenance. Pumps, hoses, pond liner, filter, sand and gravel, landscaping rock are just some of the supplies you will need, long before the beautiful plants and decorations go in. What about the labor? Will you dig it yourself or do you hire a landscaping contractor? Even smaller water features are 18 inches deep or more – that is a lot of digging, especially in hard or heavy soil. Make sure to check for utilities and consult local laws and ordinances before embarking on a water feature in your yard.

Maintenance probably should be your next consideration, after safety. Cleaning debris from the water and filters is essential,

**NDSU** EXTENSION SERVICE

## INSIDE THIS ISSUE

- Water Garden .....1-3
- Hardy Hibiscus ..... 3-4
- Plant a Tree..... 4-6
- Nourishing a Community .....6-7
- Diabetes Prevention .....7
- Master Gardener News..... 8
- Botanical Refresher ..... 8
- Garden Center..... 9
- Rice Hulls .....10
- Horticultural Events ..... 11

especially in a new pond. Fish and other water creatures will need care as well, including proper food, appropriate water quality and seasonal considerations. While it is possible to have your fish hibernate in the pond over winter, the pond needs to be sufficiently deep and it cannot freeze over, so constant aeration and heating will be necessary.

If you are thinking about adding a pond or water feature to your garden, there are many resources and suppliers available, both on the internet and locally. Local building stores and garden centers can provide the materials needed, including pumps aerators, pond liners, plants, and even complete kits and expertise to help the do-it-yourselfers. Pet and specialty stores can help you with aquatic plants (Fig. 2) and fish, as well as foods, nutrients and



Fig. 2 photo courtesy of Peg Boe.



Fig. 3 photo courtesy of Kathleen Wiese.



Fig. 4 photo courtesy of Kathleen Wiese.

water quality materials to maintain your new water feature. On the internet, online retailers such as The Pond Guy ([www.thepondguy.com](http://www.thepondguy.com)) and Doctors Foster and Smith ([www.drsofostersmith.com](http://www.drsofostersmith.com)) are just a click away.

Kathleen Wiese, a Bismarck Master Gardener, has a beautiful pond at her home north of the city (Fig. 3). In the remainder of this article, Kathleen offers some valuable advice and insight into what to expect, especially in the early years.

Make your pond as large as you can. Since enlarging my pond after Mother Nature decided to drop trees in the old one and puncture the liner, I have found that a larger pond is easier to care for than a smaller pond. It took a full two seasons to get the larger mass of water into balance – it's about 8,000 gallons, compared to the old one around 3,500 gallons. By adding the beneficial bacteria in appropriate amounts and having the right percentage of plants and fish, it is much less work than the smaller pond was. I no longer have to drain it in the spring and wash the muck out. Muck reducers can also help the pond clean itself in a couple weeks' time.

Make sure that you have the appropriate pH, oxygen, and nitrate levels before introducing fish to the pond. Water quality testing is critical, especially in the first years because it takes your pond water some time to create the balance of beneficial bacteria, plants, shade, and aeration. All of these factors contribute to making pond care easier. With the pond well established, I only test periodically - in the spring when snow melt runs into the pond, after heavy rains which add water and nutrients to the pond, or if I see some type of issue with algae or fish behavior.

Watching your fishes' behavior is important (Fig. 4). If they are low on oxygen, or if ammonia, nitrite, chlorine, or mineral levels are high, your fish may start flipping or showing strange swim behavior. They also do this as a normal part of spawning season, but outside of that, strange fish behavior is usually a cause for concern, and is frequently related to water quality. It can also be related to diseases, but water quality is the first place to look.

Aeration is also important - you can't have

too much aeration. There are probably experts who might disagree with that, but keeping the water moving and filtered all the time cuts back on the stress of pond management.

Keeping the filters clean is also critical. In the spring, when the winter muck is working its way out of the pond, and in the fall, when there is more debris because of falling leaves, I check the filtration system a couple times a day and use a net to remove any floating debris off the surface. Ideally, your pond should be situated away from trees or other foliage that is likely to get into the water, but hey, who wants to sit by a pond with no shade and no beautiful flowers to surround you? So, I compensate by keeping the net by the pond filter.

You may have to experiment to find the best beneficial bacteria and cleaners for your pond. I tried several different types in the first couple years until I finally found a formula for cold water and one for warm water that works very well in our environment. The use of ultraviolet lights to control algae is somewhat controversial. Some people say they are detrimental because they kill beneficial bacteria. Others believe there may be a time and a place for them. It is important to shut the light off for 12 to 24 hours after adding beneficial bacteria or you may be defeating the purpose.

In the spring, when the pond is first thawing and coming back to life after winter, there is always a large algae bloom. I've learned to live with that, because it usually clears itself up in 2 to 3 weeks. If algae becomes a real problem, I will use algaecides sparingly because of the plants in the pond. Some algaecides are

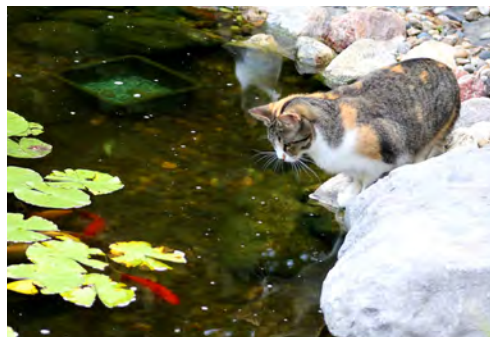


Fig. 4 photo courtesy of Kathleen Wiese.

detrimental to your beneficial plants. I also am cautious about algaecides because our dog and cats drink out of the pond (Fig. 5), as well as wildlife that come through the yard and stop for a drink once in a while. The birds think it is their private swimming pool (Fig. 6).

If I am having trouble with algae, or if the pH, nitrite, or ammonia levels are problematic, I will switch out about 1/3 of the water over a 24 hour period. I slowly pump the water out and add fresh back in even more slowly. Be cautious about chlorine levels when adding fresh water; just add at a small trickle to give the chlorine time to dissipate without building up excessively high levels. A "helper" decided to take care of the pond for me and put the garden hose in full blast. I came out a few hours later and my Ryukin goldfish were all floating belly up. The good thing is that their sensitivity to chlorine warned me to do something before the much more expensive koi did the same.

About two-thirds of the pond's surface should be covered with plants, and have oxygenating plants submerged. The plant coverage controls algae growth, helps maintain more stable water temperature, and also provides the fish protection from predators. The first few years, I purchased annual surface plants (water lettuce and water hyacinths). As the water lilies grew, I kept reducing the number of annuals I had to buy to maintain that cover. I still buy some anachris and hornwort each year for submerged oxygenators.

Most ponds can support about an inch of fish per square foot of water surface. In my pond, the fish reproduce prolifically, so



Fig. 6 photo courtesy of Kathleen Wiese.

periodically I "go fishing" and rehome some of them. You don't have to have the one inch of fish per square foot, but having fish definitely makes it easier to keep your pond clean and in balance because they forage excess nutrients and algae.

Fish food is one place where you should not try to be frugal in your pond management. Buying a high quality fish food that is formulated to protect water quality is key. I use pellets for the larger fish and flakes for the smaller ones. Overfeeding is one of the main reasons for problems with water quality. I feed twice a day most days, in the morning while it is still cool and in the evening after it has cooled down. The warmer the water, the lower the oxygen content, and fish need oxygen to digest their food. Try to avoid feeding if there is a storm coming, as rain water will also reduce the amount of available oxygen in the pond. Give them only as much as they can completely eat before it becomes water logged and sinks to the bottom of the pond to become muck. That amount varies by the type of food; generally they need to have it all eaten within about five minutes.

I use regular formulation food in the summer, and cool water formulation in the spring and fall. Cool water food is for water

temperatures in the 50 to 65 degree range, and warm water formulation for 65 degrees and over. Once the water temperature gets to 50 degrees and lower, I stop feeding because the fish begin to move into a state of torpor and are not able to digest food.

In late fall, I pull the waterfall pump and place a 800 to 1000 gallon per hour bubbler pump directly into the pond, along with a heater. The fish overwinter at the bottom of the pond, which is about 4 feet deep. The bubbler pump keeps it oxygenated and the heater keeps an opening in the ice for oxygen to enter the water. If there is an extended warm stretch, I keep a close eye on the water and unplug the heater if the ice begins to thaw too much. Layers of ice form during freeze and thaw cycles and I had a couple fish get caught between the layers. Then we had to have a fish funeral come spring. In extreme cold, as long as there is an opening somewhere in the ice and the water is moving under the ice cap it has created, it's generally ok. It is not recommended to try to break open the ice, as the reverberation through the water from hitting the ice can harm the fish (Fig. 7).

As soon as the filter bucket and skimmer unit thaw in the spring, the big pumps go back in. I have one 5000 gph pump for the waterfall



Fig. 7 photo courtesy of Kathleen Wiese

and another 3500 gph pump for additional aeration in the pond itself. I've had the best luck with pumps that are the hybrid direct drive and magnetic drive combinations, which seem to last longer and are more efficient. Since we no longer have a pond supply store that carries the large size, in-pond pump systems, I learned to keep an extra pump on hand. There's nothing more nerve-wracking than losing your aeration system in mid-August when the temps are 100 degrees and you need to figure out how to keep your fish alive until the new pump is delivered!

Kathleen is a self-confessed gardening addict - check out her blog at <https://wieseacres.blogspot.com>



# Winter Hardy Hibiscus

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

In the last issue we featured the stunning tropical hibiscus plants. These plants can thrive all year in plant hardiness zones 10 and 11. In our region, a temperature of less than 50° F can damage the plant and demise is certain with freezing temperatures. Enter the hardy hibiscus (*Hibiscus spp.*) in which many varieties can survive in zone 4 (Fig. 1 to Fig. 4). Hardy, perennial or winter hardy hibiscus are descendants of Rose Mallow, Hibiscus moscheutos, Hibiscus mutabilis or Hibiscus coccineus. All varieties of hardy hibiscus are native to areas with cold, harsh winters.

In addition to hardiness, there are several distinct differences between the hardy hibiscus and the tropical hibiscus.

HH = Hardy Hibiscus, TH = Tropical Hibiscus

- HH are deciduous, TH are evergreen
- HH can be large plant size up to 15' X 8', TH plant size 4-10' X 5-8'
- HH have very large blooms up to 12", TH smaller blooms 3-4"
- HH leaves medium green heart shaped, TH leaves dark green and glossy
- HH blooms most often white, pink or red, TH blooms many colors and multi-colors

In the past, one could identify a tropical hibiscus vs. a hardy hibiscus by bloom color. A salmon, yellow or bi-color bloom meant it was a tropical hibiscus. This is no longer true. Dr. Dariusz Malinowski from the Texas A&M AgriLife research breeding team stated, "The introduction of a purple color in the cultivar 'Plum Crazy' by Fleming Brothers in 1999 was an important progress in the winter-hardy hibiscus breeding." The Fleming Brothers also specialize in compact



Fig. 1 Cherry Cheesecake (photo courtesy of Missouri Botanical Garden)

hardy hibiscus in the 3-5' height range.

The beautiful Blue Angel was the first bluish hardy hibiscus created by the AgriLife team and they have now come up with a salmon colored hardy hibiscus as well. Malinowski also stated, "In the past six years, we have disclosed to the Texas A&M University System Office of Technology and Commercialization more than 180 unique lines of



Fig. 2 Cranberry Crush  
(photo courtesy of Missouri Botanical Garden)



Fig. 3 DiscoBelle Pink  
(photo courtesy of Missouri Botanical Garden)



Fig. 4 Summer Storm  
(photo courtesy of Missouri Botanical Garden)

winter-hardy hibiscus with very unusual flower and leaf color and shape.”

To grow hardy hibiscus in our area, plant a more compact variety in a protected and sunny location. The soil does need to be kept moist, but well drained. The plant dies back to the ground in winter and should be well mulched with organic matter such as wood chips.

Adam, from Sheyenne Gardens in Harwood, ND, said no one variety is thought to be most hardy for our area, although shorter varieties have been more successful. He does not recommend hardy hibiscus for the novice gardener as some years they just won't survive which can be disheartening to the beginner. Patience is necessary as they can be late

to emerge, even as late as mid-June. Hardy hibiscus plants are now available at several local nurseries as well as by mail order.

#### Sources:

- <https://www.hunker.com/12003483/difference-between-a-hardy-hibiscus-and-tropical-hibiscus>
- <https://homeguides.sfgate.com/difference-between-hardy-hibiscus-tropical-hibiscus-26536.html>
- <https://phys.org/news/2015-11-painter-palette-winter-hardy-hibiscus.html>

# He Who Plants a Tree, Plants Hope...

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

**D**riving north on Towner's (ND) main street, the paved road meanders past the rodeo grounds, the old horse racing tracks, and pastures of cattle before a beautiful stand of trees encompasses the intricate workings of the Towner State Nursery. Nestled inside are several buildings, one of which is occupied by Nursery Manager, Jeff Smette and his staff. Prominently displayed on Smette's wall is a plaque that reads: He who plants a tree, plants hope. Even though Smette has only been nursery manager since July of 2009, he has been a champion for trees his entire life. He earned his degree in Urban Forestry from MSU-Bottineau in 1985, and worked for Lowe's Garden Center in Minot as an assistant nursery manager and landscape designer for 23 years. He has served on the ND Nursery and Greenhouse Association's Board, and has been an active member of the Granville Tree Committee since it was founded in 1992. At the Towner State Nursery, Smette is responsible for administering all programs, including the tree production program, tree sales/distribution, budgets/purchasing, planning, information/education, as well as grants/contracts.

According to Smette, the Towner State Nursery is the only conifer (evergreen) seedling nursery in North Dakota. Its mission is to produce and market high quality nursery stock for conservation tree plantings. The US Forest Service Nursery was started in 1935, but halted tree production in 1942 during World War II. It was reactivated in 1951 by the North Dakota Forest Service. The trees are primarily



Fig. 1 Trees being hand picked for transplanting (photo courtesy of Jeff Smette)

used in shelterbelts, living snow fences, forestry block plantings and for wildlife. There was a State Forest Nursery on the west side of Bottineau, ND until 1970 when it was closed because of poor water quality and high soil salinity. At that time, all nursery production was moved to the Towner State Nursery.

Employees at the nursery are busy year around, although the crew is smaller in the winter months. There are five full-time employees, four to five seasonal employees, and 25 part-time employees. Equipment maintenance, seed cleaning, and planning begin in January, with seeding in the greenhouse starting around the 20th of February. A full greenhouse contains about 120,000 trees. The nursery staff works to net around 90,000 salable greenhouse trees.

Depending on the weather, trees are lifted (harvested) in April and May. Each tree is graded according to size, appearance, and root growth, and packaged for shipping. In mid-May, the first round of transplanting is underway (Fig. 1). Well over one million trees are transplanted yearly, with a target of planting 40,000 per day. Toward the end of May, a second wave of greenhouse seeding takes place. As the ground warms in June and July, cover crops are planted, weeding starts, and shade frames are put on the seed beds (Fig. 2). Throughout the summer, beds are checked, irrigated, weeded, and cover crops are mowed. Right after Labor Day, more transplanting is done. Smette is always looking for healthy trees from which to collect seed. He searches for trees that are thriving in our climate, and have longevity (Fig. 3). From August until the end of the active season in early December, more seed is collected, and more grading and packaging take place.

The Towner State Nursery is highly mechanized with conveyors, fork lifts, and harvesting equipment that aid workers (Fig. 4). Modern equipment makes it possible for four people to harvest 60,000 trees per day. In the past, the same job would require 12 people. Even with modern equipment, Smette says trees are labor intensive, and he gives high praise to his employees for their dedication. The nursery is a self-supporting operation, and since the beginning has produced over 90 million trees (Fig. 5). They also provide tree improvement services, such as testing, evaluation, selection, and development of improved nursery stock for forestry and conservation plantings.

Each tree species has a specific set of requirements for proper germination. Smette cited several examples: Scotch pine take the most work because seeds need to be soaked for 12-18 hours, and then dried. Pine and spruce have cold stratification requirements (stored for 30-60 days at 32-38 degrees F). Another example, is the high heat/fire needed to open Jack pinecones. Junipers require very complex stratification requirements. Seed is placed in moist sand in a cooler in January, and then seeded in July. It eventually germinates the following spring.

The nursery contains 160 acres, divided into four specific areas. All fields are numbered, and can be irrigated. The nursery is on a large aquifer so there are 13 wells, each approximately 30 feet deep. Beds are 500 feet long (Fig. 6). Crops are rotated, and the sandy loam soil (which is ideal for trees) is tested to insure optimal growth. An air seeder that plants five or seven rows at a time is used. It blows out one inch bands of seed in rows that are 10 inches apart and 1/4 to 1/2 inch deep. Once seedlings are three to six inches tall, they are transplanted three inches apart. They will remain in transplant beds for 1-2 years. Time needed from seed to salable tree is 3-4 years. The nursery staff tries to have a five-year supply of the main species at all times.

Most trees are sold regionally, with about 60% going to soil conservation districts. Smette said, "We don't want to compete with private industry, we want to work with communities, to benefit everyone; 90% of our stock is bare root, the other 10% is in containers." The top seven tree species sold by the Towner State Nursery are: eastern redcedar (especially good for wildlife), Rocky Mountain juniper, ponderosa pine, Black Hills spruce, Colorado spruce, Scotch pine, and Meyer spruce. Shipments are also sent to Canada, however, trees sold to Canada must be bare root stock or grown in containers of soilless medium like peat moss and vermiculite. Over 2.5 million trees have been sold by the Towner State Nursery in the past three years (880,840 in 2018; 820,619 in 2017; and 849,454 in 2016).



Fig. 2 Workers push frames for shade cloth into the soil (photo courtesy of Jeff Smette)



Fig 3 A boom truck is used to pick cones (photo courtesy of Jeff Smette)



Fig. 4 Trees are being lifted (harvested), then will be graded and packaged (photo courtesy of Jeff Smette)



Fig. 5 The six millionth tree started at the Towner State Nursery was planted on the McHenry County Courthouse lawn May 7, 1976 by then Governor Arthur Link (photo courtesy of Corinne Frey)



Fig. 6 Ten thousand Colorado Spruce trees grow in each 40 inch wide by 500 foot long bed (photo courtesy of Jeff Smette)

Smette was asked if he had a favorite tree quote. He immediately replied, "The best time to plant a tree was 20 years ago, the second best is today."

For more information about the Towner State Nursery, or to order trees, contact the nursery staff at 701-537-5636, by email [nursery@srt.com](mailto:nursery@srt.com), or find them on facebook TownerStateNursery.

The Towner State Nursery and the North Dakota Forest service are administratively aligned with North Dakota State University, and the State Forester reports to the president of the university.

## Bibliography

- [www.facebook.com/TownerStateNursery](http://www.facebook.com/TownerStateNursery)
- [www.ndsu.edu/ndfs](http://www.ndsu.edu/ndfs)
- North Dakota Forest Service Celebrating a Century...in Images! Created by Loretta Forsberg, Administration Team Leader. Edited by Larry A. Kotchman, State Forester and Glenda E. Fauske, Information and Education Coordinator, 2018.

# Nourishing a Community

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

United Tribes Technical College (UTTC) in Bismarck, North Dakota has been providing education and training opportunities to Native Americans for over 43 years. Certification and degree programs range from welding and heavy equipment operations to environmental science, research and culinary arts. An upcoming program, still in its development stages, is the Sustainable Agriculture and Community Food Systems (SACFS) degree. I met with Land Grant Director, Brian McGinness to learn more about the program and what existing gardening opportunities students can experience on the campus.

To be honest, I go into this meeting not knowing much about UTTC or the programs it offers. I've biked on to the campus in previous summers to catch a peek of their gardens. I had heard they were growing some heirloom varieties and I rolled around the campus directionless hoping to catch a glimpse. I admit that I'm a bit clueless and ask Brian to tell me more about his background and the campus. Brian joined the extension staff in 2017. His career experience includes establishing the largest organic vegetable operation in North Dakota, managing a

3,600-acre ranch and organic farm in Hawaii, and teaching science and environmental education. Finding his position at UTTC as the Land Grant Director has allowed him a means to integrate his interests and find greater purpose. "When we allow food to connect us to the earth, to each other, we're nourished in mind, body, and spirit." The creation of the sustainable agriculture program will help to make these connections, and allow students

from the gardens in the school cafeteria. Since 1996, the school has maintained gardens/research plots for squash and upwards of 70 varieties of corn. Some seeds are donated heirlooms while others are purchased from commercial seed suppliers. They often hand-pollinate the vegetables and keep the seeds of the most successful varieties.

There is also a traditional Arikara garden maintained by Robert Fox, a Sahnish/Santee

***"There is a more of a spiritual approach... it's not just like N, P, K, and dollars and cents... it's a more holistic approach."***

and their families to learn about growing their own food and nourishing their bodies while earning a degree.

Many students and families have already been positively impacted by gardening at UTTC. The college campus accommodates far more than students through family housing, a pre-school, elementary school, and a day care. Nearly every child has been in contact with the gardens through their own schooling programs, and many have eaten the produce

rancher from Fort Berthold. Robert grows corn, squash and beans using companion planting methods and traditional practices such as ceremonies and prayer. He involves children and families in gathering food from the field and in the threshing of beans. A tarp is placed on the ground covered with beans and the children scamper atop helping to release the dried beans. While the children may think of it as play, they simultaneously bring "the kids' spirits to the seeds," notes Brian.

Robert has also brought in an elder who told the families, "It's important to care for your seeds...and love them like relatives." One little girl that heard this advice brought a cob of corn home with her, swaddled it and slept with it that night. While telling this story, I can tell

culinary students access to fresh produce for gastronomic study and broadened dining options in the school cafeteria, and there's also hope that one day there will be enough produce to be sold at the monthly community-based Winter Market held on campus.

**"it's important to care for your seeds... and love them like relatives."**

that is very touching for Brian. With heartfelt reflection he asks, "Scientifically one could ask how did that corn fair to others in growth, but one could also ask what impact did it have on the girl? That corn has already started to feed this girl even before she ever ate it." In a western world where grain trades are seen as commodities, there is a different approach on the campus and in their teachings. "There is a more of a spiritual approach...it's not just like N, P, K, and dollars and cents...it's a more holistic approach," Brian added.

Developing the SACFS program will also bring some improvements to the campus. With the assistance of many grants, the students will soon have up to four high tunnels (96' by 30'), and a four-season greenhouse. Increased food productions will offer

As my discussion with Brian comes to a conclusion, Brian volunteers to show me more of the campus. We exit what I thought was their main kitchen, and I'm led to an even larger kitchen, one spacious enough to compete with many restaurants. One of the first things I notice is a large bag of dried corn. I ask what the plans are for this corn, and Brian hypothesizes it will be ground or may be treated through nixtamalization. I'm utterly fascinated as I've just learned that hominy is an overlooked and tasty dish. In excitement, I peer over at a small fridge and see bags of dehydrated squash. For all of us that love to grow our own food and find it rewarding to see the labor of love nourishing ourselves and our loved ones; I'm happy to see their bounties in the kitchen.

The last room we enter is what appears to be a large garage with an attractive mural of running bison overhead. I learn the space serves multiple purposes; as storage for their large equipment, a research area and a root cellar. Tucked behind the bright yellow pay loader is what looks like an indoor vegetable garden with grow lights. As we approach, I hear running water and spot a large tub. Brian explains that it is actually an aquaponics system. The tub is filled with live tilapia; the water from the aquaculture system feeds through a hydroponic system to the plants and then is recirculated back to the aquaculture system. I've never seen such a system and it seems like the kind of innovation that I would only read about and never see for myself. In the dead of winter, nestled in a dark shop garage is bright swiss chard, celery and herbs being grown along fish in a sci-fi symbiotic relationship. On a blue tarp next to a fish tub lay a couple hundred red onions from the last season. Needless to say, I am really impressed. For a campus I didn't know much about an hour ago, I feel like there are some really great things happening here, and leave knowing that the community is being nourished in more ways than one.

# Custom Master Gardener Course Focuses on Diabetes Prevention

By Laura Kourajian, lkourajian@yahoo.com

**T**he NDSU Extension Master Gardener program is expanding in 2019 to include a unique 11-week course for more than 50 members of the Three Affiliated Tribes on the Fort Berthold Reservation in northwestern North Dakota. The idea for the course came about when The Elbowoods Memorial Health Center on the reservation received a grant for the prevention of diabetes, and the grant was written to include gardening. "That really started the wheels turning on something unique that we could do that had great potential outcomes," Esther McGinnis, NDSU Extension horticulturist, said.

Native Americans have the highest proportion of diabetes in the United States, with about 16 percent of adult Native Americans having the disease. The national average for all adults in the U.S. is 9.3 percent, according to 2014 statistics from the Centers for Disease Control. "We put our heads together and we realized the standard core course wasn't going to do the job," McGinnis said.

Since the purpose of the course is to improve people's health, the focus will be on edibles, not ornamentals, and will include lectures on nutrition and food preservation. While the standard Master Gardener course is 10 weeks, this custom course, which started in February, will run 11 weeks, and will include a session on ethnobotany, or looking at plants that are native to the area and understanding how Native

American cultures used those plants, whether for food, fiber or medicinal purposes. The grant also includes funding for community gardens to enable people to grow their own healthy foods.

Perhaps the biggest surprise is the number of people who signed up for the course. While they were hoping for a dozen or so students, more than 50 registered to take the course. "It just kind of exploded," McGinnis noted. "These are leaders of their community, so we are hoping they will share what they're learning with others." Some of the participants will go through the process to become certified Master Gardeners, other are taking the class as "pro-hort" students, meaning they do not have the volunteer hour requirements, nor the future requirement for continuing education.

"This is really about diabetes prevention," she said. "The No. 1 goal here is preventing diabetes on the reservation."



Esther McGinnis,  
NDSU Extension horticulturist

# Master Gardener News

## Therapeutic Horticulture

The newest program is therapeutic horticulture, which will include small grants for Master Gardeners to work with nursing homes, and can include growing plants indoors as well as gardening outdoors. The goal is to measure the benefits of growing plants; from improving the physical conditions of nursing home residents, like lowering blood pressure for instance, as well as improving the psychological component of their lives, like improving mood. Esther McGinnis has held several webinars on the program and grants. Further information is available by emailing McGinnis at [esther.mcginis@ndsu.edu](mailto:esther.mcginis@ndsu.edu).



## Master Gardener Awards Banquet

The annual Master Gardener Awards Banquet will be planned for late spring. Watch for information.

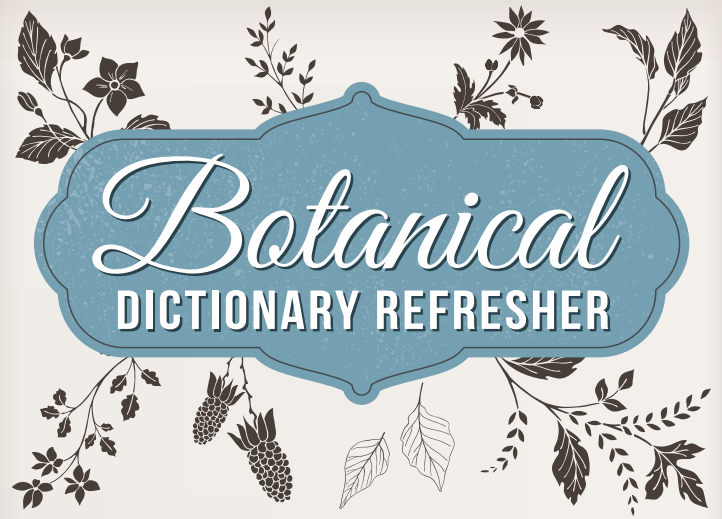
## Pollinator Gardens

While there is limited funding available for new gardens, there may be supplemental grants available for established gardens. Watch for more information on that, or check it out at <https://www.ag.ndsu.edu/mastergardener>.



## Masters Gardener Requirements

North Dakota Masters Gardener requirements are now equal to the minimum required by the national Master Gardener program. After several years of ramping up the numbers, the volunteer and continuing education requirements for certified Master Gardeners to remain certified will not change for 2019. For 2019, certified Master Gardeners will need to report 20 hours of volunteering and 10 hours of continuing education between Nov. 1, 2018 and Oct. 3, 2019 to maintain certification. Forms for reporting can be found at <https://www.ag.ndsu.edu/mastergardener/forms>



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

Prefixes that pertain to shapes and sizes :

**angusti- narrow**

Family Lamiaceae, English Lavender (*Lavandula angustifolia*)

**cyclo- circular**

Family Goosefoot , Winged Pigweed (*Cycloloma atriplicifolium*)

**fili- thread-like**

Family Rosceae, Queen of the Prairie (*Filipendula rubra*)

**lanci- lance-shaped**

Family Marantaceae, Rattlesnake Plant (*Calathea lancifolia*) Fig. 1

**odonto- tooth-shaped**

Odontoglossum genus of about 100 orchids

**ovi- egg-shaped**

Family Crassulaceae, Moonstone (*Pachyphytum oviferum*)

**pachy- thick**

Succulent Moonstone (see ovi)

**steno- narrow**

Family cactaceae, Brain cactus (*Stenocactus multicostatus*)

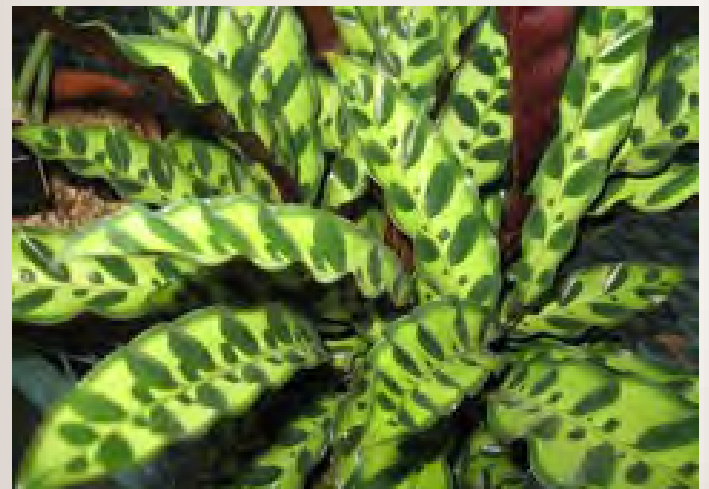


Fig. 1 Rattlesnake Plant (photo courtesy of Missouri Botanical Garden)



# What's New at the Garden Center?

By Allyson Burcham of S & S Landscaping, [Allysonburcham@sandslandscaping.com](mailto:Allysonburcham@sandslandscaping.com)

**A**fter 11 years as a horticulturist in the Midwest, I am never surprised by how eager everyone gets for the spring. Once winter is over people are ready to enjoy their outdoor spaces and elevate their landscapes. As the manager of a nursery and retail garden center it is my job to supply a wide range of plant options to help customers achieve their individual goals. Luckily, the obstacles that come with every new season are met with a host of varieties that are introduced to satisfy them. The growers in our area have added many exciting tree, shrub, and perennial varieties that will be available in garden centers this season.

## **First Editions® Parkland Pillar Birch (Fig. 1)**

Parkland Pillar is a beautiful upright tree that serves as a great columnar anchor for foundation plantings or in a border as a screen. Its dense growth habit emphasizes its deep green foliage and vibrant yellow fall color. Great for urban plantings, it is tolerant of hot, dry sites, and alkaline soil. It is notably hardy for zone 3 and would make a durable and attractive accent to any home's landscape.

## **First Editions® Fireside® Ninebark - (Fig. 2)**

With a mature size of 5-7' tall and 4-6' wide, this savvy shrub fills a niche between other smaller and larger ninebarks. Fireside has dramatic deep purple color with pale pink/white blooms that contrast its foliage and has shown improved resistance to powdery mildew. The overall form differs from other ninebarks featuring a neater growth habit instead of the more naturalized appearance. This makes it a good choice for those who are looking for drastic color without having to do a lot of yearly shaping. The applications of this beauty are wide and varied as it can be a focal point, back drop, or accent in many areas.

## **Little Moonshine Yarrow (Fig. 3)**

A wonderfully compact version of its larger sibling, this screaming yellow perennial grows densely, at 12-14" tall, and blooms early with flowers that are just as large as the original. Still with fine leaves and great drought tolerance its condensed growing habit enables this favorite to be used in the foreground of the garden where it pairs with other medium growers that may have been shaded out by it in the past. This sun lover is a bright long-lasting bloomer and is a great addition for vibrant color with little maintenance.

This is only a small sampling of so many



Fig. 2 First Editions® Fireside® Ninebark - *Physocarpus opulifolius* 'UMNHarpell' PPAF

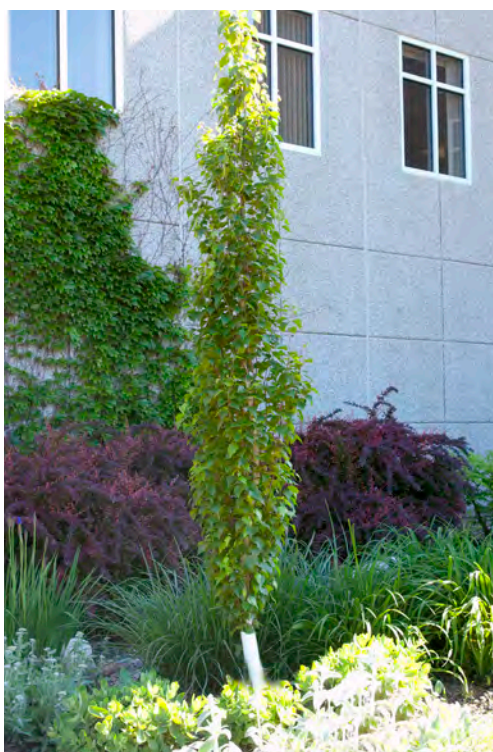


Fig. 1 First Editions® Parkland Pillar Birch - *Betula platyphylla* 'Jefpark' PP25,468



Fig. 3 Little Moonshine Yarrow - *Achillea millefolium* 'ACBZ0002' PP28,179

new varieties to explore this year. Now, in my sixth season serving the Fargo-Moorhead community, I continue to learn from the experiences of my clients that a well-rounded plant palette includes a good mix of, not only tried and true staples, but also an evolving collection of new introductions that address the varying challenges of the modern gardener. I like to reflect this idea in the collection of

plants I assemble at the garden center each year and I can't wait for all the growth this season has to offer.

## **Sources**

<http://www.baileynurseries.com/new-varieties-2019> Photos courtesy of Bailey Nurseries, used with permission.

<http://www.missouribotanicalgarden.org>



# Rice Hulls

By Caitlin Stegmiller, [Cait.steg@gmail.com](mailto:Cait.steg@gmail.com)



**R**ice is one of the top ten agriculture commodities produced in the United States. A by-product of the rice production, rice hulls have already been used in several other industries including construction and beer brewing. In the past few decades, rice hulls have been used increasingly in horticulture, most notably as a replacement for perlite.

In 2010, Purdue University published a study comparing the effects perlite and rice hulls on growth regulators used in greenhouse plantings. Pansies and calibrachoa were planted in 80-20 mixes of both peat/perlite and peat/rice hulls. The study found the plants in both mixes had similar height and stem lengths. Subsequent studies have further proved rice hulls' ability to compete with perlite as a soil amendment, including growth trials at the University of Arkansas, where vinca, geranium, impatiens, marigold and pansies all had similar growth regardless of a perlite or rice hulls substrate.

Most gardeners are familiar with perlite. It is an excellent addition to planting media, touted for its ability to create pore space and aid in drainage. However, perlite is not without its downfalls. Before this mineral reaches the store shelves, perlite must be mined, heated, and often times further processed before it can be sold for horticulture use. This

intensive process, combined with its relatively heavy weight makes perlite an expensive and unsustainable commodity. On average, perlite sells for \$6.25 per cubic foot compared to as little as \$1.45 per cubic foot for rice hulls.

Rice hulls are not only less expensive than perlite, but they are also lighter weight and renewable. A bushel of rice hulls (about eight gallons) weighs only nine pounds. Rice grains and hulls are harvested together, and then separated in a mill. The result is a tiny, canoe-like husk, perfect for increasing pore space in planting media. It is recommended to use parboiled rice hulls for gardening. This process makes the hulls sterile, negating concern for contamination from pesticide residue or weed seed. Rice hulls also have a relatively neutral pH, and when making up less than half of a planting substrate, have not proven to affect chemical properties in the growing media.

While this article has focused mainly on using parboiled rice hulls to replace perlite, keep in mind there are several other uses for hulls in gardening. They have been used successfully as a media for hydroponic growing systems, a top dressing around container plants to deter fungus gnats, and general mulch for gardens. You may also find rice hulls in seed mixes, as their inert qualities make them a good component to bulk up mixes for more even seed distribution.

There have even been some reports of using straight rice hulls to start seeds! To use as a perlite replacement, most research has found a substrate comprised of 20%-30% parboiled rice hulls to be optimum. Potting soil, worm castings and other compost can be used to make up the remaining amount of the planting media.

Personally, I have had some difficulty locating rice hulls in the central part of North Dakota. However, I have been able to find several nurseries and garden centers in the eastern part of the state and into Minnesota which offer hulls. Rice hulls can be purchased in a variety of premixed bags, or plain in bags ranging in size from a few quarts to larger, compressed bales.

Research has proven that rice hulls are a viable planting media amendment. They have a wide range of uses in horticulture and are a renewable and inexpensive resource. If you can track some down, they are certainly worth a try this growing season.

## Resources and Further Reading:

[www.riceland.com/uploads/pages/rice\\_4pages\\_1-2012.pdf](http://www.riceland.com/uploads/pages/rice_4pages_1-2012.pdf)

[www.usarice.com/discover-us-rice/find-a-supplier/rice-supplier-directory](http://www.usarice.com/discover-us-rice/find-a-supplier/rice-supplier-directory)

# 2019 Horticultural Workshops and Events for North Dakota

**March 25**      **Spring Fever Forum, Session 1**

<https://www.ag.ndsu.edu/springfever>

**March 30**      **NDSU Extension High Tunnel Workshop (Fargo)**

<https://www.ag.ndsu.edu/high-tunnel>

**March 30**      **NoAH Garden Club's Gardening Saturday (Minot)**

<https://www.ag.ndsu.edu/mastergardener/docs/Minot2019GardeningSaturday.pdf>

**April 1**        **Spring Fever Forum, Session 2**

<https://www.ag.ndsu.edu/springfever>

**April 5-6**     **Dakota Garden Expo (Bismarck)**

<https://www.ag.ndsu.edu/dakotagardenexpo>

**April 6**        **Grand Forks Gardening Saturday**

<https://www.ag.ndsu.edu/grandforkscountyextension/events/gardening-saturday>

**April 8**        **Spring Fever Forum, Session 3**

<https://www.ag.ndsu.edu/springfever>

**April 11**      **Pretty Bloomers Garden Workshop (Breckenridge, MN)**

<https://business.wahpetonbreckenridgechamber.com/events/details/spring-gardening-workshop-salad-supper-1827>

**April 12-13**   **Metigoshe Ministries: Grace-Filled Gardens**

<http://metigosheministries.com/retreats/adult/>

**April 15**      **Spring Fever Forum, Session 4**

<https://www.ag.ndsu.edu/springfever>

**May 4**         **Jamestown Gardening Saturday**

**May 15**        **Sargent County Horticulture Workshop**

**August 7**     **NDSU Horticulture Research Field Day (Absaraka)**

**September 5**   **Plants, Local Foods & Outdoor Spaces (NDSU Campus)**



NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to:

Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, [ndsu.eoaa@ndsu.edu](mailto:ndsu.eoaa@ndsu.edu).



**Have a story idea?**

Email Rachel Brag, [rbinndak@gmail.com](mailto:rbinndak@gmail.com)  
or contact one of our writers directly.