

THE DIRT



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NORTH DAKOTA MASTER GARDENER PROGRAM NEWSLETTER

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Coming Attractions for the Master Gardener Program

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

As 2016 draws to a close, it is time to look forward to the 2017 year. The Master Gardener program has exciting new initiatives and an out-of-state field trip for next year.

Pollinator Garden Initiative Continues

Master Gardeners designed and planted 18 county pollinator gardens in 16 counties across North Dakota in 2016.

After a year of growth and nurturing, these gardens will be ready to be used for educational purposes in 2017. The goal is to hold classes to inspire homeowners to include native pollinator plants in their gardens to provide food and habitat for our bees and butterflies.

To assist Master Gardeners and Extension agents in their educational programming, the program will provide a powerpoint presentation (ready by December, 2016), two Extension pollinator publications (Bee-utiful Landscapes and Butterfly Gardening in North Dakota) and a brochure template. These teaching tools, along with a map of all garden locations, can be found on the website.

The brochure template, developed by the Richland County Master Gardeners, can be customized with the names of the plants that were chosen for each garden.

To ensure each county pollinator garden is at its most beautiful, an additional \$100 will be awarded to each of the original 16 counties in Spring 2017 to purchase annuals, native perennial plants, fertilizer and small supplies.

In March, the Master Gardener program will announce funding for four or five new pollinator gardens. Grant criteria will be revealed at that time.

The second phase of the program initiative is to encourage homeowners to incorporate native plants into their gardens to become an oasis for bees and butterflies. Homeowners who meet the criteria for a pollinator garden will receive an 8-inch x 8-inch Master Gardener Certified Pollinator Garden sign they can mount in their gardens.

So far, 47 people have applied for the sign, signing up a total of more than 61,000 square feet of home pollinator gardens. More signs will be available in 2017.

If you would like to apply for a sign, please click on the following link:
<https://goo.gl/KQnxCv>

Master Gardener Diagnostician

The demand for horticultural information is high in North Dakota.

Beginning in March, 2017, certified Master Gardeners can take advanced diagnostic training in Fargo or online to qualify for the title of Master Gardener Diagnostician.

This training will cover a wide variety of topics, including diagnosis of ornamental plants, trees, lawns, vegetables and fruits. The purpose of this training is to empower Master Gardeners to answer home garden questions with confidence and accuracy. The training will be offered free of charge and will include many valuable resources.

Master Gardener Diagnosticians will have opportunities to answer questions at local garden centers, in Extension offices and through a new online "widget" called Ask an

NDSU EXTENSION SERVICE

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This attractive sign is available for homeowners who meet certain criteria.

Expert Powered by NDSU Extension Master Gardeners.

The online widget will be available on our Master Gardener website and will allow North Dakota gardeners to post a detailed



This pollinator garden was planted by our Rolette County Master Gardeners at the International Peace Gardens.

question, their county of residence, and relevant photos for diagnosis or further follow-up. This will be a great volunteer opportunity for Master Gardeners around the state.

Recruitment will begin in January.

Horticultural Therapy

The mandate of the Master Gardener program is simply to be a blessing to the state we know and love.

Horticultural therapy can be a tool to reach out to many segments of the population, such as residents in nursing homes, children with disabilities and veterans.

Using curriculum developed by the New Jersey Master Gardener program, Master Gardeners will be trained to lead exercises that will help individuals improve their fine motor skills and discover the healing power of horticulture.

The horticultural therapy program will be offered in October, 2017, to certified Master Gardeners. Participants who complete training and work with residents in nursing homes, children with disabilities or veterans will receive an advanced title that will be determined at a later date.

Horticultural therapy will be offered instead of the Master Gardener Core

Course in Fall, 2017.

Master Gardener Field Trip

The Master Gardener program is considering a chartered bus trip to Chicago in 2017 to visit the Morton Arboretum and the Chicago Botanic Garden. Todd West and Esther McGinnis would lead the field trip and Master Gardener interns and volunteers who are in good standing would be invited, along with NDSU horticulture students. Todd West has many connections at these two institutions.

The trip is still in the beginning planning phases and would depend upon many economic considerations.

2017 Volunteer Hour Requirements for Certified Master Gardeners

As decided at the Master Gardener Conference, certified Master Gardeners will be required to complete 16 hours of volunteer service and 10 hours of continuing education in 2017. This winter, the program will work on a "retired" or "emeritus" status for those individuals that have reached a certain age or have physical ailments that may preclude them from actively volunteering. Input will be sought in designing this status.

Growing Hops

By Rena Mehlhoff, rena.mehlhoff@gmail.com



Hop cones. Photo by Kyla Splichal, research specialist in Horticulture/Crop Research at the NDSU Williston Research Extension Center.

Growing hops has found a growing audience among North Dakota gardeners and home beer brewers, and NDSU researchers are conducting research on varieties that may do well in the state.

What are hops?

Hops are strobiles, which are papery, cone-like flowers of the female hop plant, *Humulus lupulus*, and belongs to the Cannabaceae family.

Hop plants are native to North Dakota and grow around our river systems.

While hops have been used for anxiety, sleep aid and other medicines, they are most well known as the stability and flavoring agent in beer.

The Hop Plant

Hop plants are a perennial plant that is often referred to as a vine, but in actuality they are a bine.

While a vine uses tendrils, thorns and other protrusions to grip as it climbs, a bine uses a strong stem and trichomes (small hairs), growing in a clockwise direction, to aid in its grip for climbing.

Each spring, the hop plant will produce these bines from the crown, or rhizomes, growing 4 to 10 inches a day if the conditions are right.

During the spring months, plants focus their growth on the main bines, climbing upright. Around the summer solstice (late June) when days get shorter, the plants will transition to the reproductive growth phase developing side-arm shoots where it produces the clusters of half-inch to 4-inch cones.

Hops are dioecious, which means they have separate male and female plants. Only the female produces the cones/flowers used for brewing or medicinal purposes.

Hop Varieties

"Recommending varieties is tricky because there are hundreds of cultivars out there and it all depends on what the grower wishes to do with their hop cones," said Kyla Splichal,

research specialist in Horticulture/Crop Research at the NDSU Williston Research Extension Center. "I would recommend taking a look at the varieties out on the market.

"A good listing is USAhops," Splichal continued. "They have a nice listing of varieties that are available to the public, statistics and a listing of the percent alpha and beta acids.

These numbers are important to the brewer, she said.

"So if the grower doesn't care about making beer, any variety will do as long as it's disease-free and vigorous," she noted.

Hops have been grown at the Williston Research Extension Center since 2009, but with recent funding from the USDA Specialty Crop Block Grant, a variety trial has been initiated.

Twelve popular varieties have been grown, including Challenger, Galena, Cascade, Nugget, Newport, Centennial, Willamette, Glacier, Brewer's Gold, Zues, Mt. Hood and Spalt Select

Research data can be found here: <https://www.ag.ndsu.edu/WillistonREC/documents/Hops2015.pdf>

Planting and Trellising

Hop plants should be planted in the spring. Purchasing hop plants can be done in two ways: plants or rhizomes.

Purchasing and planting female plants propagated from certified stock ensures the production of flowers, disease resistance, health and strength of the plant, since it's a duplicate or clone of the stock plant.

Sowing seeds is not recommended due to the dioecious nature of the plant, resulting in the possibility of male plants versus the prized female plants.

For home gardeners looking for hops as an ornamental plant or for home brewing, rhizomes are more economical in terms of pricing, but Splichal said you should order them early in the season, pot them up and grow them out to see if they express any serious signs of disease before planting them into your garden.

Doing so may save you the headache of introducing diseases into your garden, she said.

Hops are also easily propagated by division, so friends and fellow gardeners currently growing hops might be willing to share their healthy hop plants.

Sturdy support is needed from a trellis, pergola or some other structure because of the vigorous growth of the plants.

Training new shoots must be done in a clockwise direction, otherwise the plants

will not successfully grow. The crown will produce multiple shoots, but only the best looking two or three healthiest, most vigorous disease-free bines should be trained onto the trellis.

Splichal recommended all other shoots can be cut off or left to grow, although this will leave things a bit unsightly as the hop plants grow on themselves. She said it's best to cut off the new shoots to keep your growing area clean and allow for air movement, which helps reduce disease. This will have to be done a few times during the growing season.

Under the right conditions they can spread rapidly, up to 25 feet in a single season.

When pruning and training hops, it is recommended to wear long sleeves and gloves. The trichomes (pokey hairs) on the stems and underside of the leaves are sharp and can cause abrasion and irritation to the skin.

Splichal said growers should not harvest the first year's cones as this allows the plant in its entirety to continue photosynthesizing until freeze-up in order to obtain enough energy reserves for the winter and hopefully emerge vigorously in the spring.

If home gardeners plan on harvesting the hops, harvest in the fall beginning around mid-August. It is usually done by clipping the hop bine at the base of the plant and at the top of the trellis and handpicking the cones.

Fertilizer and Irrigation needs

Hop plants enjoy full sun, nitrogen and irrigation, but well drained soil is a must. They do not tolerate sitting in water. Soil pH should range between 6.5 to 8, and most cultivars are hardy to zone 3. Hop plants are really easy to grow and can quickly get out of control if not properly cared for.

Diseases & Pests

Hop plants are prone to various diseases and pests. It's important to purchase plants from reputable growers to ensure you obtain a top quality, disease-free plant.

Diseases of particular interest include downy mildew, powdery mildew, gray mold, crown rots, root rots, wilts and cankers.



Trellis system used at the NDSU Williston Research Extension Center. Photo by Tyler Tjelde, Irrigation Agronomist at the NDSU Williston Research Extension Center.

Viruses and viroids include apple mosaic and hop stunt viroid.

The most notable insect pests are aphids and spider mites, which can vector the diseases mentioned above. Hops can also harbor hop flea beetles, Japanese beetles, cucumber beetles, rose chafer beetles, leafhoppers, root weevils, and several species of Lepidopteran larvae (moths and butterflies).

Beer

If home gardeners are interested in using their hops in beer making, there are a multitude of resources online to help the homebrewer. North Dakota also has several homebrew clubs to aid you in your quest of the perfect brew.

Fargo-Moorhead <http://www.prairiehomebrewers.org/>

Dickinson <http://www.heartriverhomebrewers.com/>

Bismarck-Mandan <https://www.facebook.com/MuddyRiverMashers>

Grand Forks <https://www.facebook.com/groups/Uffdahbrewers/>

Minot <https://www.facebook.com/groups/120628508013979/>



GROW

By Laura Kourajian, lkourajian@yahoo.com

Jenny Adams and 14 newfound friends love to play a game called Vegetable Bingo, and have learned to identify vegetables they might not normally see on their plates or identify in the grocery store. Veggies like zucchini and green onions and chives.

They have also learned to grow vegetables and cook them in delicious dishes like tortellini.

Jenny and her friends are adults with developmental disabilities and they have participated in GROW (Gardening Recreational Opportunity With Friends).

GROW started as a seed in Pat Weinberg's head when she was casting about for a project to fulfill the volunteer hours she needed to complete her Master Gardener internship in the fall of 2013, after retiring from a career as a special education teacher.

"I was thinking, 'What would be a good project?'" she recalled. "I wanted to do something worthwhile."

She started thinking about Lucas, her then 24-year-old son who had recently moved into his own apartment with a roommate and wasn't eating so healthy, or at least not as healthy as his mother wished he would.

Lucas has Down Syndrome. Pat figured if he would benefit from learning to grow his own food and eat healthier, so would other adults with developmental disabilities.

Pat began to research and learned that while any gardener can tell you there are health benefits to getting dirt under your fingernails, there really is such a thing as horticulture therapy, and it's being offered in various places throughout the country for people on the autism spectrum as well as those dealing with health issues.

She discovered a program in Syracuse, New York, and made contact with the leader of that program, only to discover it was much more advanced than what she was planning, and came complete with a horticulturist on staff and greenhouses in which to grow their plants.

Pat was on her own to develop her idea, it seemed.

Starting to GROW

She began talking to friends, many of them also retired special ed teachers, and she found many willing to help out with this kernel of a project that was taking root in her mind.

She was able to get a 20 X 20 plot in the

community gardens in Bismarck located near the Burleigh County Extension office.

She and her retired teacher friends thought about the students they'd taught, contacted several and were able to get five gardeners signed up that first year, along with four mentors (volunteers).

"I funded it the first year," she noted. "We used my garden tools. It was a shoestring operation."

It was successful, and it was a starting point.

In the fall of 2014, she happened upon a meeting of the North Dakota State Council on Developmental Disabilities, and discovered they had grant money to give away. She applied for and received a \$2,500 Small Innovative grant, and with that grant came some marketing support that generated local media coverage.

GROW graduated to two 20 X 20 plots adjacent to each other, with 17 gardeners and six mentors.

Pat added a cooking segment to the project, and hired a Family and Consumer Science teacher to lead that monthly class at a Bismarck church. It was a bit cramped – church kitchens aren't typically equipped for several small groups to be cooking at once – but it worked. The gardeners were learning to cook and eat the vegetables they were growing.

"We keep evolving," Pat said.

By year three, this past growing season, again with help from a grant from the State DD Council and Designer Genes, they added a third adjacent plot and began using "Look, Cook and Eat," an online cooking magazine designed specifically for those with developmental disabilities, to help the gardeners cook and eat meals that incorporate the vegetables they grow.

Getting started

The gardeners and mentors start in early May with a social, where they get to meet the other gardeners. Many of them are repeat gardeners and know



Pat Weinberg started GROW as a project to help adults with developmental disabilities learn to garden while at the same time completing her Master Gardener internship requirement for volunteer hours.



Mentor Kris Ronningen helped gardeners Caleb Clarys and Lucas Weinberg weigh their harvest.

A Mystery Plant

Pat Weinberg said the GROW group had an interesting experience in 2016 that will lead them to try something new and unusual in their garden every summer. Here's her story:

I had picked up a couple of extra "melon" plants, thinking our original plants didn't look so good. I assumed they were a type of watermelon.

They really started to take off, and several of our neighbor gardeners asked what they were too, never having seen anything quite like it. They were big (up to 30 pounds), round and green.

We finally cut one open, not knowing if it was ripe. The flesh was pale white, with a few seeds, and it tasted a bit like a very mild cucumber.

I took it to the Burleigh County Extension office, and they were stumped too. After a little research on their part, their best guess was a Winter Melon. Who knew?

It certainly drew people's attention, so we think it would be fun to always plant something new and unusual to keep us all guessing.

each other, but every year brings a few new faces.

By the third week in May, they start putting seeds in the ground, after Pat has done the early work of marking the plots, getting the soil amended, buying the seed and other assorted duties that come with planning a garden.

In Year 1, Pat wrote up instructions for the gardeners to follow. In Year 2, those first-year gardeners already knew what to do from their experience the previous year, and several Master Gardeners signed on as additional mentors.

The gardeners offer input on what vegetables they want to grow – corn and carrots are the two favorites, and kale proved to be not on anyone’s favorite list and wasn’t invited back after the first year. They have also participated in NDSU’s vegetable trials, keeping track of what grows well and what they like and dislike.

The gardeners and mentors are divided into two groups. One group takes care of the gardens on Tuesday evenings, and the other is out there on Thursday evenings.

The program accommodates gardeners with physical disabilities by offering small raised gardens in trugs for those who can’t move easily through the rows. The trugs were sponsored through Burleigh County Public Health/Burleigh County Extension.

“We modify and adapt,” Pat said. “We want to be part of the community.”

They discover what works and what doesn’t work.

This year, for instance, they discovered that poking small holes in plastic 2-liter bottles, burying them next to tomatoes and peppers and using funnels to fill them with water helps the gardeners get a sense of how much water each plant needs.

Sharing the harvest

When the vegetables are ready for harvest, they weigh the evening’s largesse so they can document it for the grant, and then the gardeners take what they want to eat at home that week. (Pat said she noticed gardeners were taking home more vegetables this year than they did the first two years.)

Any remaining vegetables – 375 pounds this year -- are donated to the Ruth Meiers Hospitality House in Bismarck.

Once a month, they have a cooking session, now at Bismarck Century High School’s FACS classroom.

Bingo!

Here’s where the Vegetable Bingo comes in.

At the end of each monthly cooking session, they play Vegetable Bingo, and most of the gardeners can recognize the vegetables from



Gardener Angie Hoerauf and Deb McPherson, a Master Gardener intern, pulled the biggest broccoli plant after it finished producing for the year.



Mentor Danya Hilts and gardener Jenny Adams planted onions around the perimeter of the garden to help deter pests.



Matt Saylor and Ron Pilzer picked one of the delicious cantaloupes the GROW gardeners grew last summer.

the pictures the caller holds up. It’s clearly the most popular event of the evening except for, maybe, eating the sweet slice of cantaloupe they grew for themselves.

For the GROW family -- and they feel like a family, right down to proudly wearing their GROW T-shirts -- the best thing about the program is a toss up between cooking the vegetables they’ve grown and spending time with friends for this seed-to-table program.

(The GROW program can be easily replicated in other communities. For more information, contact Pat Weinberg at samawe@bis.midco.net. For grant information, contact the ND State Council on Developmental Disabilities at 919 S. 7th St., Suite 503, Bismarck, N.D. 58504.)



Gardeners Sheldon Himmelspach, Caleb Clarys and Lucas Weinberg picked out a pumpkin to take home. Big pumpkins proved very popular, Pat said, and next year they will rent a garden space just for pumpkins so they can grow more.

Theme Gardens

By Lila Hlebichuk, lilahl@yahoo.com



Wiese Acres 2016.

In another month we will start receiving seed catalogs and the planning and dreaming of our upcoming gardens begins.

If you do not have a theme garden, this may be the year to take your gardening skills to a new level of creativity.

General good gardening practices, including appropriate design, balance and structure apply to themes. You can use bulbs, perennials, annuals, vines, grasses, shrubs, trees, paths, seating, statuary and artwork to make your garden come alive.

Ideas for theme gardens are limited only by your imagination. You and your neighbor may have the same theme, but totally different gardens.

Some ideas for theme gardens include:

Pollinator Gardens

- Native plant gardens
- Butterfly gardens
- Hummingbird gardens

Single Species Gardens

- Daylily gardens
- Rose gardens
- Peony gardens
- Grass gardens
- Succulent gardens

Single or Limited Color Gardens

- Purple and white
- Gray or silver

Children Gardens

- Storybook gardens
- Animal gardens
- Fairy gardens

Herb Gardens

- Knot gardens
- Native American medicine wheel

Memorial Gardens

- Nostalgia gardens
- Scripture gardens
- Rosary gardens
- Zen gardens

Fragrance Gardens

- Kitchen herb garden
- Fragrant flower garden

Whimsical Gardens

- Romantic gardens
- Shakespeare gardens
- Secret gardens
- Moon gardens
- Winter gardens

Creating a theme garden can be the opportunity to try new plants like Glass Gem corn in a children's garden, an Eglantine (Sweetbriar) rose in your Shakespeare garden or splurging on a new peony for your memorial garden.

In an upcoming issue of The Dirt we plan to highlight some of the great theme gardens and gardeners in North Dakota. If you have a theme garden and photos you would like us to consider for publication please contact me at lilahl@yahoo.com

Sources:

Theme Gardens by Barbara Damrosch
Bee-utiful Landscapes: Building a Pollinator Garden by Esther McGinnis
Wieseacres.blogspot.com by Kathleen Thomas Wiese

Recognizing and Controlling Spotted Wing Drosophila in Raspberries

By Rachel Brag, rbinndak@gmail.com

Rising in the early morning to pick raspberries is one my favorite times to be in the garden.

The cool fresh raspberries are a treat to eat just picked, bursting with berry flavor. How disappointing and repulsive to find SWD larvae (fig 1) inhabiting the perfectly ripe fruit that were intended for immediate consumption or the cereal bowl.

Spotted wing drosophila (SWD) is a very small vinegar fly that lays it's eggs in healthy ripening fruit (fig 2). The fly is less than half the size of one drupelet which make up the raspberry fruit.



Fig. 1 photo by Stephen Flanagan used with permission.



Fig. 2 John Obermeyer, Purdue Extension Entomology.

They target late season crops such as raspberries, tart cherries, everbearing strawberries and blackberries. SWD was first found in 2008 in the state of California and has spread to many states, including North Dakota in 2013.

The NDSU Extension Service has published a helpful bulletin (E1715) with information about SWD and controlling an infestation.

I planted Caroline raspberries, a fall-bearing variety, in the spring of 2012. In 2013, the berries produced very late in the fall (not much production), resulting from heavy snow in April and a cooler than average spring. They were so late that all SWD flies (if present) would have died due to fall frosts.

2014 was a repeat of the prior year with just a few berries on the canes. I was beginning to wonder if planting a late season variety was a mistake. I learned about SWD when taking the Master Gardener course in September, 2014, and was very disappointed to hear that a new pest had arrived in the state.

In 2015 my fears of having planted the wrong variety were laid to rest. The canes had a decent amount of blossoms and fruit.

The first several pickings in late summer produced huge berries as big as the top half of my thumb (fig 3).

I was on the lookout for SWD. Upon flattening several berries and checking the inside towards the end, I spotted movement. The larvae are small and white, less than $\frac{1}{8}$ inch.

I didn't like to have to flatten all the berries just to find out if there was larvae inside so I started to observe the coloration on the receptacle or torus. I noticed a trend: If the berry had larvae inside, the receptacle was colored dark fuchsia or bright pink (fig 4).

If the berry did not have larvae in it, the receptacle had no color on it and was entirely light yellow green (fig 5).

I learned that certain areas were more likely to be affected. Berries on canes that were top heavy and low to the ground were more likely to be host to SWD larvae. Also, berries located in areas of the patch that were dense were more susceptible to SWD laying eggs in the nearly ripe fruit.

This year I watched the maturing raspberries very closely and again found evidence of SWD. The raspberries were loaded with big berries, so I came up with a game plan.

Overripe berries that fell off the canes were not left to spoil on the ground. They were



Fig. 3



Fig. 4



Fig. 5

picked up and put in a bowl to be discarded. I checked each berry as I picked them for the bright pink juice on the receptacle. Any berries found hosting SWD larvae were put in the "discard" bowl.

My preferred method of disposal was to flush the infected berries down the toilet. An alternative method of disposal is to put berries in a sealed plastic bag and place in the sun until larvae have matured and died.

This method of monitoring worked until about the end of second week of berry season, when I started to find more berries infected than I was willing to throw out.

I resorted to spraying with a Spinosad insect spray. I own a hand sprayer that puts out a very fine mist (fig 6). The end of the sprayer can be bent so the spray was directed toward the ground, under the canopy of the raspberries and not on the berries.

I would place the long spraying wand under the tops of the canes and move/point it in all



Fig. 6

directions. I sprayed in the evening hours to avoid insecticide exposure to bees and other pollinators.

Immediately I noticed a complete and total reduction of berries with larvae. For the rest of the season, I monitored all the berries when I picked them and sprayed when necessary. I sprayed a total of three times from the third week of August to the first week of October. The spray I used had minimum one day wait (pre-harvest interval) from last application to harvest.

My grandsons visited in late October and picked the last of the berries. They relished eating them as they picked them and I enjoyed seeing their berry stained faces and hands, knowing there were no SWD larvae in the berries.

It was a good berry season with many ice cream pails filled from a patch no larger than 8' x 15'. It was worth the time and effort to monitor and protect my raspberries from SWD and next year I will do so again.



Have a story idea?

Email Laura Kourajian at lkourajian@yahoo.com or contact one of our writers directly.