

YELLOWSTONE MASTER GARDENER NEWSLETTER



Yellowstone Master Gardeners
 P.O. Box 35021
 Billings, MT 59107

Volume 7 Issue 2

April - May - June 2018

~ Featured Master Gardener ~ Pat Morrison ~

We want hear from you
 -Send your submissions
 for newsletter to ymas-tergardener@gmail.com
 by June 15 for the next
 issue.

Editors:

- ♦ Sheri Kisch
- ♦ Ann Guthals
- ♦ Ann McKean
- ♦ Bess Lovec
- ♦ Corinna Sinclair
- ♦ Donna Canino
- ♦ Elizabeth Waddington
- ♦ Kristine Glenn
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- ♦ Temia Keel
- ♦ Tracy Livingston

Contributors:

- ♦ Amy Grandpre
- ♦ Elaine Allard
- ♦ Fay Danielsen

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Energy Creates Energy

I visited Pat Morrison on a frigidly cold day in January, when the snow was up to our hips. Pat's driveway, though, was shoveled, spotless. I assumed a service did it for her, but she does her own snow removal and gardening at the age of 84. The snow blower helps, and she handles mowing, too, in summers. With an energetic step needed to maintain her yard and keep up with her new puppy, Pippin, Pat's bright, inquisitive eyes shared her gardening experiences.

She started gardening "when I was born," she reports, chuckling. Her mother was her primary influence in what is more than a hobby to Pat. She grew up in Portland, Oregon, a moister region than here (and few are not), so her

main challenge in Montana is dryness. Pat often waters houseplants twice a week.

I had trouble seeing her yard for the snow but soon discovered that the gigantic snow mound in the front is actually a berm that her daughter, Billings Master Gardener Joann Glasser, helped her build. Pat's favorite plants are flowers, and they abound in her home. She keeps a poinsettia thriving after three years, and her Christmas cactus was blooming. She successfully winters geraniums, after trimming them in the fall, and African violets proliferate under her guidance. Pat's flower repertoire even extends to silks. Her kitchen/dining area feels more like a greenhouse than an eatery, and I doubt she staged it. This spring I hope to pop out to her home in the Heights to see the iris that was her mom's, which qualifies as "heritage" from where I sit.

However, Pat is not limited to flowers and enjoys nurturing cucumbers, strawberries, and tomatoes, although she no longer cans. She recalls, from her childhood, taking produce to a canning factory in Oregon. I asked about rabbits eating her strawberries, as they do in my neighborhood, and she praised the local fox who keeps the rabbit population in check. Her area seems urban for a fox, but, after all, this is Montana!

Her advice for new gardeners is Be Patient. Be Patient... Be patient, the kind needed for raising children, and she and her husband raised four. Joann became a Master Gardener before her mother. Pat is in her sixth year as a Master Gardener, helping at the Moss Mansion in the spring plus Metra in summers, when not working her own yard. She has participated at the zoo. With her wise perspective of time, Pat values long-range planning in public places.

Her favorite aspect of the Master Gardeners' program is, succinctly yet potently stated, fun! We are so lucky to have her on board. I don't know how she schedules it all, considering she's a mall walker in winter, thanks to her Nissan Rogue that she claims walks through snow, and walks her dog twice a day when snow is not on the ground. In addition, Pat volunteers every day at the Senior Center at the Methodist church in the Heights. I needed a nap just thinking about what all Pat does! I heard through the grapevine that Pat brings baked goods to many group MG events, and not store-bought but homemade, pies,

Continued on page 2 -

INTERVIEW Continued



cookies, and sometimes cakes. She will forever be in our hearts for this! Wow, WonderWoman. Now we can better understand where Joann gets her drive.

- By Bess Lovec

Pat sent the photo of her gloxinia bloom.

It looks like a nice specimen for the Flower Show.

SOIL 101

Evalu-

ate soil. The key to every plant's health and any garden's vitality is in the soil. Healthy soil holds enough water, air, and nutrients to sustain plant life and help it thrive. A soil test gives you a valuable analysis of your soil so you know what you need to make it better.

Improve soil. Building healthy soil is a gardener's most important task. Most soils fall short of the ideal: loose, rich in organic matter, and drainable. Adding organic materials—such as compost, rotted leaves, and peat moss—improves any soil.

From Better Homes and Gardens Soil tests = B & C Ag Consultants - 315 So. 26th, Billings

A Haiku and Thank You

Dear Master Gardener Editors,
Thank you for all your hard work! I enjoyed the Jan/Feb/Mar issue. I have passed
on your information about growing broccoli sprouts to several people.
Thank you, Julie Osslund

I am submitting a haiku for your consideration;
Black capped chickadee
Calls out a cheerful greeting
from a peaceful tree.



HERE'S THE DIRT

Getting to the Bottom of Blossom End Rot

It is always disappointing to see a tomato, squash, pepper, watermelon or an eggplant get blossom end rot (BER). It is not the end of the plant, though, just the fruit. We typically think a lack of calcium in the soil is the main reason our plants get blossom end rot and the truth is that most soil has adequate calcium especially if it is the soil that you have been growing plants in previously.

To sum up blossom end rot, it is a disorder of growing fruit that causes the fruit's cells at the blossom end of the fruit to die. So what does this really mean? If a plant has inconsistent watering that is too wet or dry this will affect how the plant will receive calcium and that imbalance can result in blossom end rot. Other causes of why a plant may experience BER are over fertilizing with nitrogen which can promote leaf growth and deplete part of the plant in receiving calcium as the water will carry the calcium towards the new leaf growth and damage to small feeder roots can also affect how the plant takes in water affecting the calcium and contributing to BER.

Some ways to resolve BER once it happens in your garden is to remove the affected fruit and monitor your watering schedule and if the problem persists you should have your soil tested and/or you may consider planting a different variety of that plant in the future. Many times we hear of garden myths like adding tums or Epsom salts as a sure fire way to resolve the issue but they are just that, myths and people probably do see some results because they are watering and paying more attention to the care of that plant. So the big take away here is that water is a key factor in resolving blossom end rot.

Submitted by Donna Canino



MOSS MANSION MASTER GARDENER VOLUNTEER OPPORTUNITY

The Moss Mansion was home to members of the prominent Billings family for eighty years. Many changes have come to the property since its development in 1903, and it is as glorious as ever in the new millennium thanks to skilled and generous Master Gardeners.

Among the many features are ten gardens, several 'vintage' cottonwoods, an elderly Russian Olive, two giant spruces, a variety of crabapple, ash and other smaller trees, expansive lawn areas and a large cedar hedge. The patio and pavilion area at the back of the property features modern brick walks and patios, stone and wood benches, overflowing flower pots in season and a large pergola festooned with Virginia Creeper. You can find lilac bushes, hydrangeas, roses, and a glorious maple that flames red-orange in the fall.

Each spring, summer and fall smiling teams of Master Gardeners gather to carefully prune, plant, feed, and clean every corner of the property under the direction of current Staff Groundskeeper Linda Brewer and long-time Board of Directors Representative Stacey Jacobs. Donations from local businesses and other generous donors keep the garden shed on site well-stocked and the beds bright with color and texture. Thousands of visitors from near and far enjoy leisurely strolls, excellent photo oppor-

tunities, and unique weddings and other events among the vibrant, healthy trees and flowers – all thanks to Yellowstone County Master Gardeners!

With the huge variety of trees, perennials, and annuals to care for our board and staff is blessed and honored to have had the knowledgeable guidance and assistance of the Montana State University Extension and Yellowstone County Master Gardeners for years since the house became a museum. Without the support of Master Gardeners, the Billings Preservation Society would not be able to maintain the house and grounds. Since 1986 millions of dollars have gone into the preservation and operation of the stately mansion, and all of those dollars come from tours, fundraisers, events and rentals, small one-time grants, and generous donors. No permanent federal or state funds are available to operate or preserve the museum, and there are no private partners who provide permanent funding.

Learn more about the Moss Mansion, our mission, and other volunteer and educational opportunities on a tour or at moss-mansion.com and on Facebook.

Submitted by Corinna Sinclair

HARD WORK AND REWARDS ~ CONGRATULATIONS TO ALL

David Kimball - \$150 for 1600 volunteer hours
Plus \$175 for 1800 volunteer hours (busy year!)

Sharon Wetsch - \$175 for 1800 volunteer hours

Joann Glasser - \$100 for 1000 volunteer hours
Plus Mantle Clock for 1200 volunteer hours (another hard worker!)

Bob Wicks – Mantle Clock for 1200 volunteer hours

Level I certified:
Joan Griffith



Bob Wicks and Joann Glasser received their clock rewards on March 14th, 2018, at the March Master Gardener Association meeting. This reward is given to Master Gardeners with 1200 volunteer hours, these two making a total of seven given out to date. Congratulations and thanks to Bob and Joann for your hard work and dedication to our Master Gardener program. It's Master Gardeners like you who validate our program.

This Association meeting was also Bob Wicks last one as president, after serving four years in this capacity. Bob has been one of the pillars who helped spearhead our association back in 2011, along with Master Gardeners Ann Guthals, Corry Mordeaux, Joann Glasser, Marion Grummett, Merita Murdock and Sharon Wetsch. I am so proud to say that all these Master Gardeners are still active in our program and have been major contributors to its success.

Thank you, Bob for your big heart, cheerful nature and tireless optimism.

- By Amy Grandpre



Praying Mantis

The first frost had finally arrived and we were dragging a large potted tree to move it to 'bed' when we caught the movement of something falling. I bent down and saw the limp form of a large praying mantis. With mixed emotions (I was sad to find her dead, but thrilled at the opportunity to hold her) I gently picked her up. As I examined her, I saw a leg move. "Agh!" I screamed, "She's alive!" I quickly started exhaling on her body to warm her and rushed her inside.

She has been quietly living on a potted tree in my dining room ever since. She rarely leaves her territory (although she disappeared for two days and reappeared on a table on Christmas morning). She has laid four egg cases. She eats a cricket a day and eagerly drinks water out of a spoon or a dropper. When I offer her water, she grabs the vessel and holds on to it until she's finished. She hugs the dropper like a baby bottle. She is so tame, she actually seems to enjoy sitting on my hand, as is evidenced by her reluctance to part from it. I liken her to an alligator because, like alligators, she moves slowly, almost in slow motion, until her prey is close, then she strikes with lightening speed and deadly accuracy. After she finishes a meal, she very methodically cleans herself like a cat, wiping her face with her foreleg and running it through her mouth to 'lick' it. I'm utterly fascinated.

Like other insects, mantises have six legs and two sets of wings, though most adult females cannot fly. They are generalized carnivorous predators, which means they eat all insects and are even occasionally cannibalistic. They are ambush predators, so they usually wait for their prey to wander by, catching it with their dexterous spiked forelegs and devouring it alive. Some species employ extremely elaborate camouflage and have evolved to mimic the appearance of their surroundings using color and shape, but the mantids with which we are most familiar rely mostly on their green and tan color for their camouflage. Mantises undergo incomplete metamorphosis, born looking like mini adults and shedding their exoskeleton as they grow. Once they reach the adult stage, they will mate. If the male is lucky and his mate isn't hungry, she may not eat him and he will escape to mate with other females. Once a female has mated, the sperm that she stores in her abdomen can fertilize multiple egg cases, which are known as ootheca. Each ootheca can contain between 30 and 100 eggs, and over the course of her 8-14 month lifespan a female can produce between 3 and 7 egg cases if she is healthy and well fed. My mantis has laid five egg cases since I found her, each one taking an hour or two to produce. The adults do not survive our harsh winter, but the foam around the eggs protects them till spring.

While there are approximately 2300 species of mantis occurring on every continent but Antarctica, the European and Chinese mantises, both introduced to the US, have become naturalized and are commonly seen in Montana. My mantis is a Chinese Mantis, Latin name *Tenodera sinensis*, and I am sure she is one of the hatchlings from the egg cases we bought at Heightened Harvest late last spring to help keep some of the less desirable insects under control as part of our Integrated Pest Management system. I think they helped make a difference.

The praying mantis is one of a small group of insects, which, like humans, have stereovision, enabling them to look with both eyes at the same spot, thus allowing excellent depth perception. A team of scientists recently discovered that they are the only insect we know of that can see in 3D- also like humans- by fitting them with tiny 3D glasses and showing them movies. Another unique trait mantises share with humans is their ability to turn their head, some up to 180 degrees. This is all evidence that they rely primarily on their sophisticated eyesight to find their prey.

Although they do have an ear (only one in the center of their thorax), their hearing is limited to a range of 30 to 150khz. Human hearing only goes up to 20khz, so my pet mantis probably can't hear me when I talk to her. It is thought that they use their hearing to detect and evade predators like bats.

Not only helpful in the garden, praying mantises are one of the most popular insects kept as pets, and it's no wonder, since, as I have discovered, they are low maintenance and easy-going although, when we took a vacation this winter, we did have to enlist a kind and open-minded neighbor to come feed her. I keep a small container of crickets (which are considerably more difficult to keep alive than the mantis) and feed her one every day or so using a pair of tweezers. She doesn't make any mess. I mist her with water when I think of it, but that's as much for the plant where she resides as it is for her. She has provided many happy moments of quiet meditative observation, and a privileged glimpse into another world. There was some momentary excitement this winter when, heavy with eggs, she apparently fell and ruptured her abdomen. She was leaking egg foam and fluid and I thought she was a goner. In a moment of inspiration (and desperation) I applied some superglue gel to her wound with a toothpick, and in a small miracle she stopped leaking and has been fine ever since!

I know she won't live forever, but I secretly hope she makes it to spring so I can set her free again. Either way, I will miss her when she's gone.

Submitted by Ann McKean

Sources:

National Audubon Field Guide to North American Insects and Spiders

<http://www.harvesttechs.com>

<https://www.insectidentification.org/insects-by-state.asp?thisState=montana>

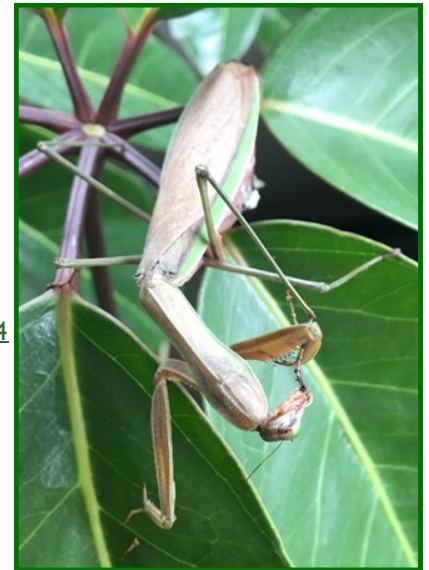
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<https://www.theverge.com/2018/2/9/16996006/praying-mantis-3d-glasses-machine-vision-biology>

<https://askentomologists.com/2015/03/12/why-do-mantids-only-have-one-ear/>



She is cleaning her foot. The blob on her abdomen is where I repaired the leak...

THE OTHER FARMERS' MARKET

Thinking about planning your garden for the summer? Consider planting a little extra to sell at the Healthy By Design Gardeners' Market.

The Healthy By Design Gardeners' Market is a community market held Thursdays, the 2nd week in June through the first week of October, 4:30-6:30pm at South Park (Intersection of S. 28th Street and 6th Avenue S.).

The goal of the Gardeners' Market is to provide an outlet for consumers to purchase fresh, healthy, local and affordable produce and eggs, as well as provide a place for local gardeners and farmers to directly sell their produce. The market is also a social meeting place to celebrate health and nutrition in the community.

The environment is relaxed and social with lots of educational activities for children as well as adults. There isn't a vendor fee, we just ask that vendors reflect the savings in the price charged for produce, and there is no commitment that you need to be at every market.

If you have questions or would like to consider this opportunity contact Maia Dickerson, market@healthybydesignyellowstone.org or 406-651-6403 and she will put you on the contact list for vendor updates and May trainings.!

- By Maia Dickerson

"The first day of spring is one thing, and the first spring day is another. The difference between them is sometimes as great as a month."

- Henry Van Dyke

ANOTHER WAY TO READ THE NEWSLETTER - WORD PRESS

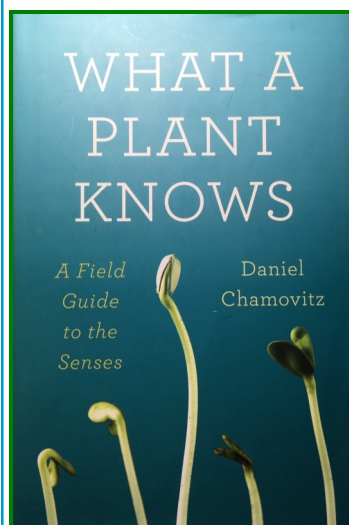
Enjoy the Yellowstone Master Gardener quarterly newsletter online! Share with friends and access recent editions in the archives. Find local interviews, interesting articles, tasty recipes, upcoming activities and opportunities, plant features and more. Save the URL in your favorites or bookmark it for quick and easy access from your computer, phone, or other connected device. Comment, share ideas, and encourage others to become a Master Gardener.

www.yellowstonemastergardenernewsletter.wordpress.com

You can contact Corinna Sinclair if you have any questions. crean.bean@yahoo.com

What A Plant Knows

By Daniel Chamovitz



Humans use their senses to get information about the world around them. We use this information, in part, to decide what actions to take. Our five main senses are sight, smell, hearing, taste, and touch. Do plants have similar senses?

In What A Plant Knows, Israeli botanist Daniel Chamovitz compares human senses with equivalent senses in plants. In each chapter, he describes a human sense, then explains whether plants have a similar ability to perceive the world around them. Plants do have senses similar to humans with one exception (hearing), because plants also need to gather information from the world and then act on this information.

For example, plants can “see,” i.e. perceive light, as we can tell when plants grow towards a light source. It is vital that plants perceive light because, for plants, light equals food. For each sense, the author explains how the sense is exhibited in a plant and also the historical development of our understanding of the ability, including clear, brief descriptions of elegant experiments. For example, for the perception of light with concurrent growth towards the light source (phototropism), Darwin hypothesized that light was perceived at the tip of a seedling so he performed the following test: one shoot was allowed to grow normally, bending toward the light; the next had the tip cut off and did not bend; the third had a dark cap on the tip and did not bend; the fourth had a glass cap on the tip and did bend; and the fifth had a band around the stem and not the tip and did bend toward the light.

In addition to the five human senses, there are chapters on how plants know where they are in space (perception of gravity) and what and how a plant remembers.

This fascinating book is so readable it's like reading a novel or a mystery—you get caught up in wanting to know the answers and find it hard to put down. When you've finished this little book, you'll have a better understanding of how plants live, function and perceive their environment, and you will also probably treat plants with more respect and appreciation for their abilities. You will find that you have more in common with plants than you might previously have thought and you will appreciate the interconnectedness of all living things. Having a better understanding of plants and how they live may also result in better care of the plants in our gardens and landscapes, as we understand their needs better.

Submitted by Ann Guthals



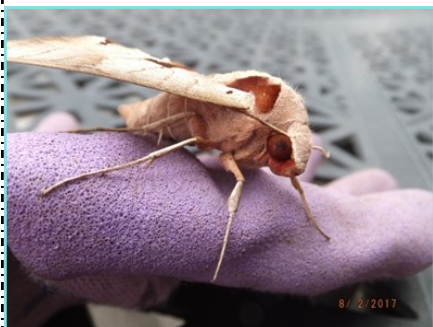
Monarch Chrysalis and Hummingbird Hawk Moth

This was in Connecticut at my son's home. Unfortunately, it disappeared before he could put it in a jar.

Photo was taken in mid-September 2017. It was on the deck railing.

The next three pictures were taken this summer while I was cleaning out the mugho pines.

Submitted by Fay Danielsen



After what seems like a very long winter, I get that anxious feeling waiting for tender green asparagus tips to peek through warm, dark soil. The garden is quiet except for the rhubarb trying to unfold and the asparagus pushing.

How many times have you thought of growing asparagus and put it off? You could be picking it already, but you thought a 3 year wait was too long. Considering that the plant can live for 25 years with little assistance and that you have already put it off 2 years, maybe not.

Asparagus can be started by seed or by root. It is dioecious, that is plants carry reproductive parts of the male and female. In the 80's all male (Jersey) varieties were introduced to dominate the female (Washington) varieties. Female plants spend part of their season producing fruit (red berries) whereas male plants produce larger, longer, and bigger yields. Sources differ on which gender produces the larger and most spears.

Asparagus beds can last for decades with no need for tedious transplanting. All they need is a well prepared bed (think 25 years, 5-6 feet deep and almost as wide), full sun, well-drained soil, and a soil test for NPK nutrients and PH (as close to neutral 7 is best).

You can plant asparagus in the garden, raised beds or flower beds as long as they are not shaded. Actually, in the garden they can be used to shade some of the shade lovers like lettuce. Keep weeds at bay and pull those dandelions when small. Remember half of your asparagus supply is below the surface. In the spring rake off any leaves and debris.

Be aware that an asparagus spotted beetle has a reddish body with dark spots. The common asparagus beetle has a dull, blue- black body with six orange- yellow spots. Both larvae are a white caterpillar about 1/2 inch long. Long black eggs are laid in a row. Both adult and larvae feed on developed plants and can cause crooked shoots. Remove leaves and weeds from around the bed to keep hibernating spots to a minimum. Beetles can be hand -picked early in the morning when it is too cool to fly.

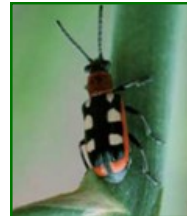
Harvest by cutting or snapping spears when 5-10" tall, cutting at ground level or before the heads start to open. Take care not to injure buds below. Spears can grow 10" in a day in an ideal crown. The first picking season, usually season two, pick only a few. The second year pick for about 4 weeks, the third year about 6 weeks and after that time you can pick for about 8 weeks. There is no real limit to the number of spears cut. It depends on the health of the plant. Be aware of space, moisture, and nutrients. After the cutting season, mulch with non-acidic materials.

In the fall, leave all the foliage (like bulbs they need the foliage to feed the roots) until it has dried to soil level, then CUT off and put down the second fertilizer of 10-10-10. Your soil sample will determine if you need bone meal, wood ash, green sand, cotton seed meal, rock phosphate or dolomite lime.

Are you ready to try growing asparagus? Or will you wait again?

For more information- <https://bonnieplants.com/growing/growing-asparagus/>
<https://www.gardeners.com/how-to/growing-asparagus/7343.html>

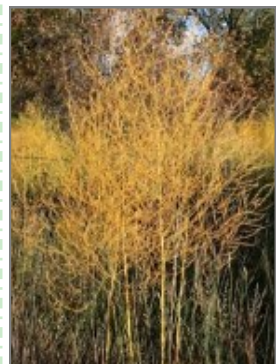
<http://labs.russell.wisc.edu/vegento/pests/asparagus-beetle/>



Submitted by Sheri Kisch

Hunting Asparagus in the Wild

Asparagus is easier to spot in late summer when its tall ferny stalks turn a brilliant canary yellow. However, asparagus can be very hard to spot in the spring when the young shoots start popping out of the ground and I find that those lucky enough to have found a patch are very reluctant to divulge the exact location. However, from what I have been able to gather the best place to look for asparagus in our area is in sunny moist areas along the river, on irrigation ditch banks, on road sides and at the edges of farm fields. If you are lucky enough to find asparagus to harvest, it is best to cut the spears at ground level and to leave a few stalks so the plant will remain healthy and spread a few seeds. It is also interesting that the asparagus plants we find in the wild are not a native plants but are cultivars that have escaped from peoples' gardens. Another tip that I found online was that the best time to search for asparagus spears was in coordination with the time lilacs bloom.



—By Elaine Allard

APRIL 13
~BLGS LIBRARY~
FAMILY MYSTERY
NIGHT 6:30 PM

APRIL 28
GREAT AMERICAN
~ **CLEANUP DAY** ~
36 N 23rd - BLGS.
9 AM

MAY 1
~ **ARBOR DAY** ~
LAUREL
MURRY PARK
10:30 - 3

MAY 3
~ **ARBOR DAY** ~
BILLINGS
OPTIMIST PARK
7:30 - 1

MAY 5
GREAT AMERICAN
~ **CLEANUP DAY** ~
LAUREL
707 W 3RD

May 8
~ **BLGS LIBRARY** ~
BEE TALK
3:30 - 5:00

MAY 19
~**GERANIUM FEST**~
ZOO MONTANA
10 - 4



FOR SALE

New Levi's
Preshrunk size
30 x 31 1/2 & 32 x 27
Call - 628-6110

MASTER GARDENER LINKS

Yard and Garden MontGuides – <http://store.msuextension.org/Departments/Yard-and-Garden.aspx>

Yard and Garden Fact Sheets – <http://mtmastergardener.org/factsheets.cfm>

Insect Diagnostics - <http://diagnostics.montana.edu/insects/>

Plant and Weed Diagnostics - <http://diagnostics.montana.edu/plant/index.html>

Disease Diagnostics - <http://diagnostics.montana.edu/plantdisease/index.html>

Mushroom Diagnostics - http://diagnostics.montana.edu/old_files_2018/mushroom/index.html

Montana Frost/Freeze/Precipitation Data by County - http://www.mtmastergardener.org/climate_data.html

Submission of Samples - http://diagnostics.montana.edu/physical_sample_submission.html

Montana State University Extension - Yard & Garden Guide- <http://gardenguide.montana.edu/>

Montana State Master Gardener Facebook page- <http://www.facebook.com/MTMastergardener>

Amy's Yearly Grapevine news - http://msuextension.org/yellowstone/horticulture/garden_grapvine.html

Yellowstone M G Newsletter Blog - www.yellowstonemastergardenernewsletter.wordpress.com

Yellowstone M G Newsletter Submissions - ymastergardener@gmail.com

**WANTED SOON**

Need cardboard egg cartons, and Costco sized plastic peanut jars for children's projects.

Elaine elaineswattergardens@hotmail.com

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

or 252-2623

YELLOWSTONE COUNTY MASTER GARDENER ASSOCIATION LINKS

Facebook page – <https://www.facebook.com/ycmga>

By using the portal below, and then typing in Yellowstone County Master Gardener Association, .5% of purchases made through this portal will be donated to the Association. You can even have an app link to connect you instantly to the sign in page. So please use this link when making Amazon purchases!

Amazon purchases – <https://smile.amazon.com/>

Association Page – <http://www.ycmgamt.com>

The YCMGA Web Page is packed with information. Calendar of upcoming events, information on Master Gardener Projects and volunteer activities, information on Yellowstone County Master Gardener Association, and minutes from past YCMGA Board meetings.

GRILLED ASPARAGUS SANDWICH

Place cooked asparagus spears on a slice of whole wheat bread covered with mayonnaise or miracle whip. Add a dash of lemon juice, paprika, fresh dill or basil, and tomato slices. Grill open or add a second slice of bread.

Submitted by Sheri Kisch

ROASTED OR GRILLED ASPARAGUS

Spread prepared, raw asparagus on a cookie sheet, drizzle with a good olive oil, give the pan a shake to coat all the spears, top with a little fresh-ground sea salt and put in a 450F oven. Shake the pan a few times while cooking to keep from sticking. Cook 10-15 minutes till tender, but before it turns black. I do a similar one but with balsamic vinegar too and a dusting of parmigiana Reggiano at the end. Yum! I do the olive oil and add chopped garlic. I especially love it done on the grill....

More good cooking from Kristine Glenn, Temia Keel & Ann McKean

The mission of the Yellowstone County Master Gardener Newsletter is to

“educate and inform”, not to advocate or persuade. The Newsletter Editorial Board takes no position endorsing or opposing, approving or disapproving, any of the assertions or arguments in the contributed information. Information submitted to the Newsletter is for your interest only.

YEARROUND HELP AT ZOO MONTANA

Zoo Montana needs you! The Botanical Society at Zoo Montana maintains all the gardens at Zoo Montana. We need all the help we can get as we have reclaimed many areas that are just waiting for some fresh ideas and maintenance during the upcoming season! Once a gardener has been shown all the gardens and participated in a short training session you are free to work at any time. We do gather on Monday mornings during the growing season and work together until 12:00 with a wonderful tea/lemonade break. There will be an evening work time this summer as well, the evening is yet to be determined. During the spring we will clear, clean, and amend the soil. After Memorial Day we plant, maintain, and watch the beautiful gardens blossom into magical areas. Please consider helping us out not only to get your hours but join us as a permanent member!

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What's up with this, Tom & Corry ? Sheri



http://www.msuextension.org/yellowstone/horticulture/master_gardener.html

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ALERT: An invasive Asian worm (Amyntas) is present in the US and can cause extensive damage. Do your research to avoid acquiring or releasing Amyntas worms. <http://blog.uvm.edu/igorres/amyntas/> More to follow.

WORMS TO REBUILD THE SOIL



Steve Charter is an innovative rancher with a cattle operation north of Billings. For the past couple of years he has been intensively studying how we can rebuild our soil biology where degraded from the use of pesticides, chemical fertilizers and over-tillage. Steve even traveled to Australia to see what measures are being used there for regenerative agriculture. To this end, Steve has developed a worm "ranch" on an industrial scale in order to harvest the vermicastings.

Steve and his partner, John Brown, use a bulldozer to create worm beds 50 yards long and two feet deep with mounded sides. He uses red wigglers, the worm of choice for composting. He places a layer of straw in the bottom of the trench, then puts the worms and compost mix on top. He cold composts a mix of wood chips, straw, kitchen scraps, coffee grounds, juice bar pulp, beet tailings, cow and horse manure, and weeds to feed the worms. He strives for a mix of carbon and nitrogen similar to compost, but the mix doesn't have to be as exact as it does with compost because he is not trying to heat it up, just feed the worms. If it does heat up, the worms can go deeper in the soil to escape the heat. The worms stay in the trenches because that is where the food is. Steve doesn't feed the worms in winter, so if they get too much food in summer, they can munch on that over the winter.

In November, he prepares the worms for winter. He covers the trenches with straw, then a water-permeable tarp, then bags of leaves. The worms lived through the winter last year. They are not completely dormant and can live as long as the temperature doesn't drop below about 40 degrees F. He hasn't been able to check the temperature this year because there is too much snow, but he is hopeful that the worms are alive.

When there is a demand, Steve harvests the vermicastings (worm "poop"). Steve and John feed the worms at one end to get the worms to move to the end of the trench, then dig up the vermicastings, which are spread to dry. The result is then put into a trummel, which tumbles the mix and sifts out larger pieces like sticks and wood chips. This product can be bagged and used directly in soil to stimulate and restore the biology of the soil. It is not a fertilizer per se but rather food for the soil web of bacteria, fungi, protozoa, nematodes and microarthropods. Compost also helps this process of restoration—adding the worm castings speeds up the process.

Another way to use the castings and make the beneficial effects go further is to make a worm tea or worm extract. To make tea, the castings are put in water with a feed like molasses and then aerated. The tea must be used within hours of preparation to keep it from going anaerobic so this process is more useful for a home operation. For an extract, the castings are added to liquid and aerated but not fed. It is more stable before application than the tea and thus more useful for a commercial operation.

Gardeners can have a worm operation and use the castings and tea or extract for lawn and garden, but need to know how to balance the feed to encourage various microbes depending on use of the final product.

Steve has primarily used his products to develop the soil on his own ranch, but will sell the castings and extract at some point commercially if all goes well. He is interested in continuing to study ways to restore the soil and educate others on the problems and solutions. For example, he is also learning about ways to sequester more carbon in the soil. Restoration agriculture is a sideline for Steve whose primary business is cattle ranching, but helping to restore the earth is a deep passion and commitment for him and he is grateful that he can put his ideas into action on his ranch.

- By

Ann Guthals

