The Blooming Bell

July 2015

Inside this edition:

Bell County Master Gardener Association

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Work Day 7 am* Burger Wednesday	2	3	
5	6	7	8 Work Day 7 am* General meeting - DVD of Greg Grant, "Gardening for Love, an Arcadian Dog Trot" 10:30 am Social time 10 am	9	10	11
12	13	14	15 Work Day 7 am*	16	17	18
19	20	21	22 Work Day 7 am* BOD Meeting 9 am	23	24	25
26	27	28	29	30	31	

*** in the event of rain, there will be No Workdays.**

"U.S. Flag" by Gualberto107, 4th of July by nuttakit at www.freedigitalphotos.net

Remember to record volunteer/education hours.

Photo of Coral Vine by Charles Newsom

Plant Swap Beauties

- Terrie Hahn

One of my favorite events in our Master Gardener program is the semi annual Plant Swap. Nothing quite like trading great plants with fellow gardeners who have tested them out. Shown here are some of the plants we've received in past Plant Swaps: Blackberry Lily, Summer Phlox, Bells of Ireland, Comfrey, Mini Jew, Borage, Rose Campion and a compact Crepe Myrtle.

And two question marks. Wish I knew what these were! It's not proper etiquette to thank anyone for a plant, but our gardens are much prettier as a result of the generosity and spirit of fun of BCMG's.

Coming in August

Aquaponics, Non-Profit

Part 2 of Gail Koontz's article on Aquaponics

Aquaponics:

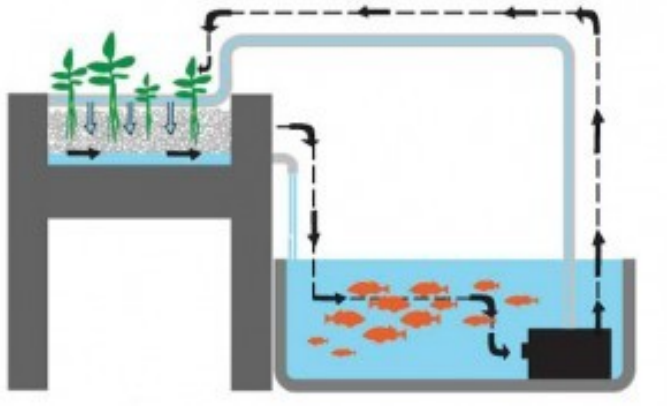
Growing Plants and Fish Together

- Gail Koontz

This is a two part series. The second part, to be published in August, will focus on non-profit Aquaponics.

Aquaponics combines aquaculture - raising freshwater fish and snails - with hydroponics - raising plants in water. Basically no chemicals or soil are needed in an aquaponic recirculating system, and these systems do not require much monitoring or measuring.

Aquaponics integrates aquaculture with hydroponics into one efficient system that produces both fish and plants. This rather revolutionary system allows fish and plants to live off each other in a mutually beneficial or symbiotic way. Waste produced by the fish is used to supply nutrients for plants grown hydroponically, a process which, in turn, purifies the water. Only



a few minutes a day are required to feed the fish, check the system, and harvest your crops.

How does aquaponics work? The two main components of an aquaponics system are the fish tank and the plant grow beds with a small pump moving the water between the two. Basically, the wastewater in the fish tank is sent to the plant bed, and the nitrifying bacteria in the grow bed convert the fish waste in the water to plant-friendly nutrients. The plants extract the nutrients in the water that promote growth, and the water passes through their roots, cleaning the water and recycling it back to the fish.

While many aquaponics system designs are available, the most common method is a flood and drain system. In this system, water is pumped from the fish tank up to the plant grow beds. Water then fills the grow bed and is gravity-fed back to the fish tank. The grow beds have sterilized lava rock, clay, worms and other microorganisms that form the basis for a completely natural, nontoxic environment. This system is a closed-loop system because it is intrinsically organic. Because of recycling, this system uses about 2 percent of the water a conventionally irrigated farm requires for the same vegetable production.

How do you know if your system is in balance and nontoxic? An aquaponics gardener, Rex Byrns, said, "My fish are my organic certification committee." Fish are very sensitive to environmental toxins. If his fish are doing well, then so are his plants. Byrns built his first backyard aquaponics system two years ago and is now testing some plants for Texas A&M University in his expanded system.

Many benefits can be realized through an aquaponics system including:

* Incredible productivity that yields large amounts of produce and fresh fish, thus reducing your grocery bills.
* All-natural fresh foods grown without chemicals, fertilizers or pesticides.
* Space efficiency because of vertical planting that takes about half the space required for a typical home garden.
* Lower maintenance because there is no weeding, and maintenance can be as little as 15 minutes per day.
* System can be built at a height appropriate for the gardener; thus, no bending, kneeling or reaching.
* Aquaponics system uses about 1/10 of the water used to grow plants in the ground.
* Yes, aquaponics systems are changing how some people think about raising food. And once the system is working, it's been described as poetic.
* Kimberly Byrns, Rex's wife, finds the sound of the continuously flowing water to be very soothing. Perhaps aquaponics is good for both body and soul as well as our environment and vocabularies.

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Aquaponics...continued

Brittney Martin wrote an interesting article for Reporting Texas (School of Journalism, UT at Austin) that pulls together a lot of interesting info about what's happening around us concerning aquaponics:
Aquaponics is a word and practice created by combining "aquaculture," or raising fish, and "hydroponics," the use of recirculating water to grow crops. While aquaponics research surfaced in the late 1960s, commercial aquaponics didn't take off until the last decade.

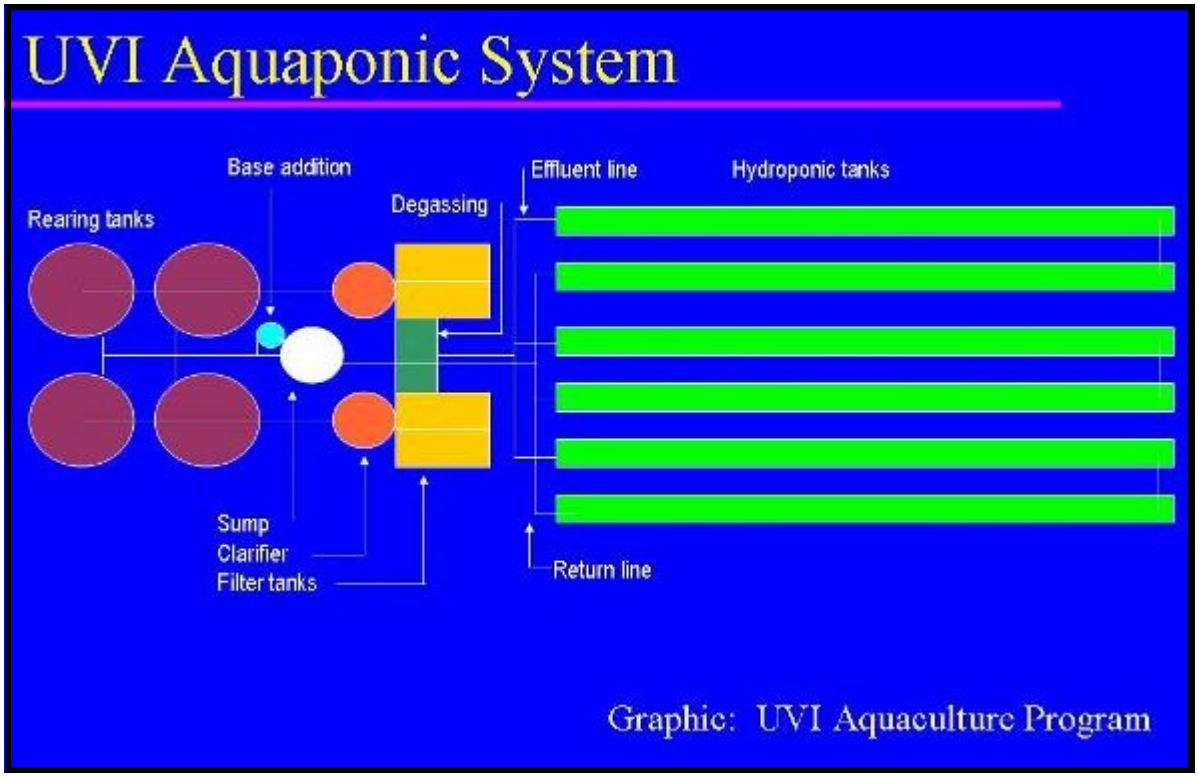
In a world where consumers pay more attention to sustainable farming, the slow food movement and organic cultivation techniques, aquaponics is taking off. The University of the Virgin Islands has trained about 680 people in commercial aquaponics between 1999 and 2013. The Aquaponics Association of North America has more than 400 voluntary members.

But the field of aquaponics has no specific definitions or parameters. Beneath the surface of the movement, people who are farming on a commercial level have already divided into groups with different belief systems and financial goals. In Texas alone, we find purists, innovators, and people who want to save the world.

THE PURIST
Adam Harwood, owner of Lily Pad Farm, lives and works on two acres of land in San Marcos. What sets him apart is his system. A self-proclaimed "purist," he traveled to the Virgin Islands to take a weeklong aquaponics workshop put on by the University of the Virgin Islands and ended up staying for months. When he returned, he bought his property and began recreating the UVI commercial system from memory. Now, 36 months later, Harwood has built three complete aquaponic systems and sells hundreds of pounds of produce and fresh tilapia every week.

Harwood was reluctant to specify how much he spent on his three systems, but said they cost between $35,000 and $50,000 to set up. He has the potential to grow 5,400 plants per month and sells them for $4 each. He harvests no more than 250 fish per week and sells them for $3 each.

Harwood swears by the UVI system. In each of his greenhouses, he has two tanks holding roughly 1,000 tilapia each. The water from those tanks is pumped into the first of three filtration systems. It collects solid waste in a cone at the base of the tank, and gravity moves the waste from that cone to a spout on the outside of the greenhouse. Harwood collects the waste and sells it as fertilizer. The water then cycles through an additional two filtration tanks where bacteria transform the wastewater into a suitable nutrient source for plants. "Fish excrete their extra nitrogen off their gills in the form of ammonia," said Donald Bailey, an aquaponics re-



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Aquaponics...continued

search specialist at UVI. "There's nitrifying bacteria on all the surface areas, and they take the ammonia and convert it through their processes into nitrates, and that's a form that plants prefer."

The wastewater then moves through a degassing tank to remove harmful gases like methane and carbon dioxide. The water then flows into two deep-water rafts each holding eight rows of floating crops. The roots are emerged at all times and take in all the nutrients they need to grow from the constantly flowing wastewater. This process not only provides a fertilizer-free, all-natural crop, but also filters the water enough to go back into the fish tanks.

This mutually beneficial system continues constantly and produces two organic end products: fresh tilapia and fruits and vegetables. Harwood sells all of his produce and fish himself at farmers markets and community-supported agriculture (CSA) systems. "When I deliver my food to the end user it has very little transportation against it, and it's still connected to its root structure, which makes it like no other conventional food you buy with the exception of buying a live chicken," Harwood said.

For many years, the broken link in aquaponics farming has been the fish feed. Organic feed can be hard to access and expensive for use on a large farm. To combat this, Harwood set out to help develop an organic fish feed, which he now uses to ensure that the entire system is completely organic.

THE INNOVATOR

A visitor could get lost in Rob Nash's greenhouse. Swiss chard and tomato plants create a maze. The smell of basil is overwhelming, and the leaves are as big as a human hand. All this teeming life is growing in the waste that is filtered and vacuumed out of an aquarium.

Rob Nash of **HannaLeigh Farm** in Austin takes a different approach. He developed his hybrid technique five years ago through a great deal of research, collaboration and experimentation. When he's not working in the greenhouse or spending time with his family, he's on online forums or meeting up with others to share ideas about aquaponics. "Aquaponics, I would say, has been one of the most open-source forms of agriculture that's ever happened because it's so relatively new, especially on a commercial level, that there's more people collaborating and exchanging information and ideas," he said.

Nash combines deep-water raft culture with what's called the media technique, which, unlike Harwood's chamber-based technique, uses gravel to filter the water. Like Harwood, he has two tilapia tanks in each greenhouse and a small pump to move water through the system. Instead of going through a series of filters and degassing chambers, however, the water flows directly into several raised garden beds filled with a media made up of granite and river rocks. As the water moves through the gravel-like combination, the fish waste is filtered out and then consumed by red wriggler worms living in the garden beds. It's actually the worm waste that acts as a natural fertilizer for the crops in the garden beds. The filtered water then flows into deep-water rafts, where more plants are growing, as in Harwood's system. Finally, the water is returned, clean and filtered, to the fish tanks.

Aquaponic farmers can raise blue, Nile and Mozambique tilapia on their private facilities if they get a series of permits. First they have to get an aquaculture license from the Texas Department of Agriculture, then a wastewater discharge permit from the Texas Commission on Environmental Quality that ensures there's no wastewater runoff from their farms. Lastly, farmers need an exotic species permit from the Texas Parks and Wildlife Department. All species of tilapia

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Aquaponics...continued

are technically prohibited in Texas; however, these three can be used in aquaculture with the proper permits. In some counties, a license is required to sell fresh fish to the public.

Nash's entire operation uses about 400 gallons of water a week. He only has to replace the water that evaporates or is taken up by the crops. This system requires significantly less water than traditional farming or hydroponic systems, which leave farmers with wastewater at the end of each cycle that has to be completely replaced and replenished with nutrients.

"I would consider my farm profitable, but it's not paying any payroll, so it's technically a break-even hobby farm at this point," Nash said. "I would need to be at least twice the size as I am for it to ever be able to pay the bills." Nash says that if he were that size he could make $1,000 take-home pay each week after accounting for the farm's weekly maintenance cost of about $500. "I personally would like to bring home at least $50,000 or I feel like I'm missing out on a different job opportunity, and my goal is to be there by spring," he said.

In the meantime, Nash sells his vegetables at the weekly farmers' market and to restaurants. As his farm grows, Nash thinks he will have to narrow his focus to just one market to keep up with the demand and maintenance. While he enjoys the intimacy of farmers' markets, he thinks the routine culture of restaurant supply will allow him to spend more time with his family. Nash also services two different markets by selling tilapia fingerlings to aquaponic system-starters and giving lessons to both backyard aquaponic gardeners and commercial farmers.

"I'd say most of the people who get into aquaponics enjoy the tinkering aspect of it because you get to put something together and watch it grow," Nash said. "Anyone who has ever attempted and/or failed at gardening can appreciate the growth that you get out of these systems and is usually real excited about doing it for themselves."

Photos from:
http://www.uvi.edu/research/agricultural-experiment-station/aquaculture-home/aquaponic-systems/default.aspx

https://globalaquaponics.wordpress.com/page/3/

https://www.facebook.com/pages/HannaLeigh-Farm

Q & A

- Jerry Lewis

Can anyone tell me the original use of this type of bucket?

Wizzie's Wonderful World of Insects

Mosquito Repellents

- Wizzie Brown, Travis County AgriLife Extension Entomologist

I was planning on doing an article on cochineal scale, but in light of recent rains, I thought I would cover mosquito repellents. I know I just did a general article on mosquitoes, but this will provide more information on the repellents themselves. As you have probably noticed, we have a bumper crop of mosquitoes this year, so make sure you take the proper precautions while spending time outside.

Activity times for mosquitoes can vary. Most people are familiar with the four D's- DRAIN (standing water), DEET (wear some repellent), DUSK & DAWN (stay indoors during dusk and dawn to avoid peak populations) and DRESS (wear long sleeves and long pants). While this is still good advice, it may be a good idea to spread the dress and repellent advice for anytime you will spend time outdoors.

When outside, try to wear long pants and a long sleeved shirt in light colors. I know it's getting hot, but if you can stand getting a little hot, it can reduce the number of mosquitoes that can reach your skin. Repellent should only be applied to clothing and exposed skin. Do not apply repellent underneath clothing! If you want to apply repellent to your face, spray your hands with repellent and rub it onto your face. Do not spray repellent directly into your face or near eyes or mouth. Make sure to apply repellent outdoors. Do not allow children to handle repellents. Wash hands before eating, smoking or using the restroom.

The Center for Disease Control (CDC) recommends using a product *registered with the EPA* (Environmental Protection Agency) containing one of the following active ingredients: DEET, picaridin, IR3535 and *some* of the products containing oil of lemon eucalyptus.

DEET, also known N,N-diethyl-m-toluamide or N,N-diemethylbenzamide, was developed by the U.S. Army in 1946 to protect soldiers in insect-infested areas. Pesticides containing DEET have been used by the general public since 1957. Products containing DEET should not be used on children younger than 2 months of age (read the label and check with your pediatrician if you have questions). DEET has a slight odor and may have a greasy feel to some people. It may damage plastic, rubber, vinyl or synthetic fabrics. DEET may be irritating to the eyes and skin for some people. DEET comes in a wide variety of concentrations, so choose the one that will work best for your situation.

Picaridin was first made in the 1980's and resembles a natural compound called piperine (which is found in plants used to produce black pepper). Picardin has been used in Europe and Australia for many years, but has only been in the U.S. since 2005. Picaridin is non-greasy and is odorless.

IR3535, or 3-[N-Butyl-N- acetyl]-aminopropionic acid, ethyl ester, was developed in the mid- 1970's and became registered for use in the U.S. in 1999. It is registered as a biopesticide by the EPA because it is functionally identical to a naturally occurring substance (an amino-acid). It may dissolve or damage plastics and may be irritating to the eyes.

Oil of lemon eucalyptus (OLE) or PMD (para-menthane-3,8-diol) are essentially the same thing; PMD is the synthesized (lab created) version of oil of lemon eucalyptus. "Pure" or "essential" oil of lemon eucalyptus is not labeled as a repellent and has not undergone testing and should not be used as a repellent product. OLE/PMD has been on the market in the U.S. since 2002. OLE/PMD should not be used on children younger than 3 years of age. The natural product (OLE) has known allergens within it while the synthetic version (PMD) has less of a risk to allergens. This product is classified as a biopesticide. OLE/PMD has a varying range of residual, some offering about 20 minutes of protection while other products may last up to two hours.

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Mosquito Repellants...continued

Many factors play into how long a repellent will last for a person. Some of these are:

- The concentration (or percent of active ingredient) of the product. You can find the percentage on the product label.
- Person's attractiveness. Some people are more attractive to mosquitoes than others (and no scientific research has proven that it is because of eating garlic, taking vitamin B, using tobacco products, etc.). A person's genetic code plays a large part on what makes a person so attractive to mosquitoes.
- Frequency and uniformity of application. In other words, how often is the repellent applied and how good of coverage did you get?
- Activity level of the person. The more active the person is, the more sweat they produce which can cause the repellent to wash off the surface of the skin.

As a word of caution, there are products that combine sunscreen and insect repellent. The CDC recommends that if you need sunscreen and repellent, that you choose two separate products. Sunscreen should be applied more often than repellents.

For more information or help with identification, contact Wizzie Brown, Texas A&M AgriLife Extension Service Program Specialist at 512.854.9600. Check out my blog at www.urban-ipm.blogspot.com

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TEXAS A&M AGRILIFE EXTENSION

June General Meeting

- Randy Brown

Forty-eight MG's attended a viewing of the Conference DVD with Speaker Felder Rushing, "Slow Texas Gardening."

How About Some Garlic?

- Werner Hahn

I just finished harvesting the last of my garlic. This year I had a bumper crop. I not only harvested the bed that I planted but many 'volunteers' that decided to pop up throughout my other vegetable beds. These bonus plants most likely developed from heads I missed digging up the previous season or from the corms that are attached to the momma heads of my elephant garlic.

If you haven't tried growing garlic yet, here is a little information to get you started.

Planting time is in the fall. I plant my garlic in November. Choose a sunny location. The soil should be loose since we want to form a nice big head underground. If needed you can work in some coarse sand and compost to loosen your soil. You can buy your garlic heads at the feed store, nursery or maybe get some from another gardener.

When you're ready to plant, crack the heads open and separate the individual cloves. It's best to do this right before planting since the individual cloves lose viability the longer they sit outside the head. Plant the individual cloves pointy side up so there is at least two inches of soil above them. I plant mine about 6 inches apart in staggered rows when I plant a whole bed. You can also plant them just along the perimeter of the bed and save the interior for other plants. Garlic plants supposedly provide some insect protection for the other plants but I wouldn't swear to that.

Your garlic should start poking through in a few weeks and grow throughout the winter. Occasional

Continued on next page...

Garlic...continued

freezes should not be a problem, in fact, cold weather is a necessity for some types of garlic. If all is successful, come spring you should have some big lush green foliage. Some garlic will send up a flower stalk known as a scape. This is normal for garlic (not good for onions) since the cloves develop around the scape. I prefer to break them off as they come up to direct more energy to bulb formation. A few I do let flower since the flower heads are pretty neat and the bees like them.

Fertilize during the growing season as needed. Stop with nitrogen once scapes appear so you don't just grow foliage and no bulb. Potassium is a good nutrient for bulb growth. But of course, any fertilization is dependent on your particular soil fertility.

Bulbing will begin when daylight length starts to exceed 13 hours and air temperatures hit 68-70 degrees. Now the tricky part is the soil temperature. We prefer that to stay cool. If the soil heats up too quickly the bulb will mature too fast and you'll wind up with a small bulb. So a good layer of mulch will help keep the soil temperatures down. Once the soil temp hits above 90, the bulb has completely matured.

Harvest time is usually May or June. When some of the leaves start to turn yellow dig up a test garlic. I like to use a garden fork. Keep it a safe distance from the plant and try to push the fork under the bulb and then lift it up out of the ground. If you just try to pull it up by the foliage it often times breaks off with the bulb still in the ground. If the bulb is a good size and you can see bulges from the cloves it should be ready. If all you have is something that looks like an onion without the bulges (a round) then try again in a week or so. Once *all* the foliage is yellow or brown, the bulb you have is as good as it's going to get so dig it up. If it is still a round, you can eat it anyway or save it and replant next year and it should clove.

After harvesting, you'll need to let the garlic dry out. Don't cut off the foliage and roots yet. Let them dry for a few weeks out of direct sunlight, somewhere with good ventilation. I lay the garlic on wire racks of hardware cloth, keeping the heads separated. After a few weeks when the necks dry up and the skin around the head becomes somewhat translucent cut off the roots and cut the foliage about an inch from the head and store the heads in a cool and dark place. Also pick out some of your biggest heads and set them aside to use as your seed stock for next year. Garlic adapts to its growing conditions. So next generations are usually better than the first.

If you planted elephant garlic (actually part of the leek family) you may have noticed that some of your heads have small brown corms attached to the outside. These can also be planted but usually take 2 or more years to produce cloved heads. As you harvest your garlic, a number of these corms will most likely break off and remain in your soil to provide volunteers for future years. Some of my best heads have come from these unexpected hibernators!

So give it a try this fall.

Photos by Terrie Hahn

- Randy Brown

The new flowers, and shrubs planted for the 2015 MG Conference have matured and really make the entry to the gardens pop!

Making Nature Masks-Learning About Camouflage

-Gail Koontz

In late May, Bell County Master Gardeners were invited to participate in Career Day at Willow Springs Elementary and in Trimmier Elementary's Science Fair. Both schools are in Killeen. During the morning at Willow Springs, some 300 second and third graders rotated through our assigned classroom as Mary Ann Everett talked and asked questions about camouflage in the insect and animal world before turning them loose to "camouflage" and make their nature masks. On the tables were an abundance of leaves, seeds, berries, bark, flowers, herbs, etc., etc., that we all had harvested from our yards the day before. Occasionally, someone would discover an insect or a caterpillar that had also been harvested. The teachers especially enjoyed the smells of the various herbs we had brought.

The next day we took part in the Science Fair during the late afternoon. The entire family was invited to come and participate in this event. It's fun to watch a mom or dad begin helping their child and then end up creating their own nature mask. Another harvesting from our yards. One of the teachers there was a Master Gardener and asked us to leave all the leftovers in her classroom so she could talk about them with her class the next day.

And as you can see from the pictures, Master Gardeners can get a little creative, too.

Photos by Gail Koontz

Yummy Recipes

A couple of recipes to use up some of those bell peppers and tomatoes from your gardens.

This dish was made by Jan for the May General Membership meeting.

Corn Salad/Dip

- Jan George

2 cans of kernel corn

2 cans of shoe peg corn

3 bell peppers (any color)

1 cup mayonnaise

1 pkg Hidden Valley Ranch dressing

1 bunch of green onions

1/4 cup candied jalapeño

2 cups cedar cheese

1 pk chili cheese Fritos

Cut all vegetables in tiny pieces, mix mayo & dressing & add to veggies & corn. Mix in cheese. Right before serving, crush Fritos & mix with corn & veggies. If I have time, I refrigerate corn & veggie mixture & add mayo & cheese the next day.

From the Conference Appreciation Dinner.

Barley and Black Bean Salad

- Terrie Hahn (from The Complete Cooking Light Cookbook, 2000)

4 C water

1 C uncooked pearl barley

1 1/2 C frozen whole kernel corn, thawed

1 1/2 C diced fresh tomato or can of diced tomato

or can of tomato and green chili's

1 C frozen peas, thawed

1 C avocado, diced *

1 - 2 T chopped fresh cilantro (can sub parsley)

1 large can black beans, drained and rinsed

2 T chopped onion

Sauce: Mix together:

4 - 5 T fresh lemon juice

1 T olive oil

½ - 1 t salt

1/4 t pepper

2 garlic cloves, chopped

Bring 4 C water to boil. Add barley; cover, reduce heat and simmer 45 minutes. Remove from heat. Cover and let stand for 5 minutes. Drain and transfer to large bowl. Add sauce and all other ingredients* to barley. Toss well. Best served at room temperature.

Barley can usually be found in bulk at stores that carry bulk items.

* This makes a very large amount, perfect for a party. If you don't think you'll eat it all the first day, serve the avocado on the side.

Announcements

July General Meeting

- Randy Brown

We will be showing the DVD of Greg Grant's "Gardening for Love" from the Conference for the July General Meeting. Social time is at 10 a.m. and the meeting at 10:30 a.m.

Grounds Work Days

- Walter Ponder

Work days for July are **(Please note new time!):**

7:00a July 1, 2015 Workday

10:30a July 1, 2015 Burger Wednesday

7:00a July 8, 2015 Workday

7:00a July 15, 2015 Workday

7:00a July 22, 2015 Workday

Smoothie Party Invite

You're Invited to the Herbal Group's Smoothie Party!

Thursday, July 23rd, 10 a.m.

Terrie Hahn's house, 321 Logan Ranch Road,

Georgetown

RSVP moompie45@hotmail.com or 512-863-9837

Please RSVP for planning purposes. Bring along **ONE** ingredient. A swimming pool is available for anyone who wishes to drink their smoothie poolside.

FYI

Opossums

- Charles Newsom

Possum on the back wall of the house. He is great at cleaning up the yard.

I found the following site that has good information on the possum's diet.

http://www.outwitcritters.com/possum/diet.html

I read somewhere that snails were on the menu also. I have not seen as many snails since these guys showed up. I occasionally supplement the offering with some baked chicken skin.

Check out BCMGA FaceBook page! Go to

https://www.facebook.com/BCMGA

What's Happening in Your Yard

- Charles Newsom

I've got Datura and Castor Bean blooming and a Turkey Hen visiting. We have lots of zipper peas (below) with all the rain we have had. I obtained seed from Homestead Heritage for corn. Gladys is showing how tall it is. Germination rate was not great, but it will be seed for next year. I used 2 x 4 wire mesh rolled into about a 30 inch circle for cucumber cages (bottom right).

What's Happening in Your Yard

See My Desert Rose In Bloom!

- Barbara Beebe

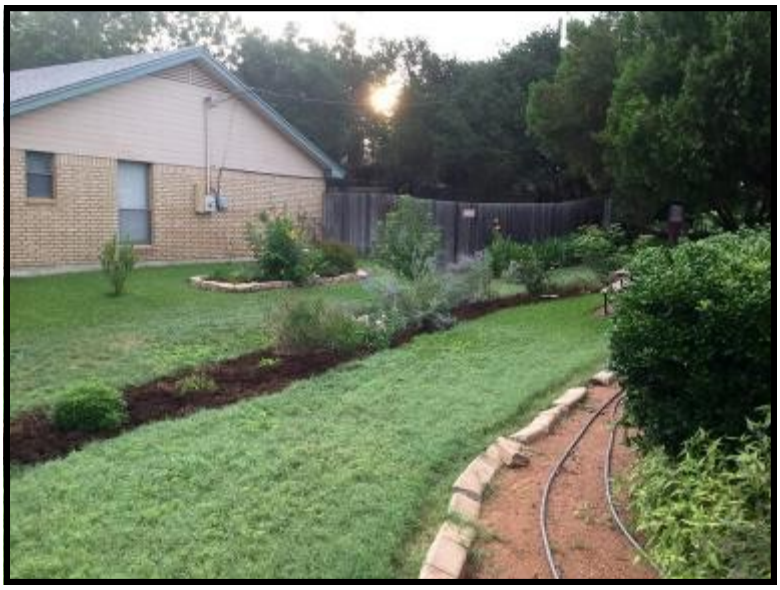
CAREFUL!

- Charles Newsom

Fawn bedded down in my lawn. Be careful with those power tools!

What's Happening in Your Yard

- Randy Brown



Beds are looking good after 13 plus inches of rain this spring/summer.

From left: Phase 1 of front bed. Phase 2 weed block. Phase 3, mulch-just need metal edger on backside for completion.

What's Happening in Your Yard

- Crystal Fisher

When I pulled up a Dandelion, it was very revealing. We all have no idea what is growing under our feet.

Ant eggs on a pile of mulch.

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*Please submit articles for the Blooming Bell as Word Documents with **photos separate as JPG files** to Terrie Hahn at:*

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Please do not send PDF documents.

It's raining, it's pouring...again! June 30th's sudden afternoon storm.