More Weeds  
by Nora Graf

Foxtail Barley (Hordeum jubatum)
Foxtails are the bane of every pet owner. The hard barbed seeds can cause serious damage if they get into your pet’s ears or eyes. This is one of the first plants to show up in the spring. Foxtails are a perennial grass, although it seems more like an annual. Once the plant sets seeds it disappears until next spring. The plant can grow 1 to 2 feet tall and are a bright green. The flowering stalks are really quite pretty when young, appearing green or with reddish cast and very soft. Unfortunately those soft bristles dry hard like little drill bits. The seeds can injure animals by becoming lodged in an animal’s eyes, lips, ears and noses. Each plant can produce around 200 seeds. Seeds are disbursed by wind, machinery and animals. The seeds do not like to be buried. Three inches of soil on top of the seeds is enough to retard germination. Foxtail reproduces both by seed and inconspicuous rhizomes.

Some of the reasons for its success are its ability to tolerate a variety of soil conditions. It can tolerate saline soils but can handle soils that range in pH from 6.4 to 9.5. It loves disturbed conditions and is one of the first plants to colonize newly cleared land. It likes disturbed ground along streams, lakes, roadsides and in irrigated pastures and ditches. The plant is drought resistant although it prefers moister conditions.

The plant is widespread, appearing throughout much of Arizona and worldwide. Apparently the plant we see today is a hybrid of an East Asian Hordeum species with a close extinct relative of a California species. Hard to believe but apparently it is grown as an ornamental in some places. It is difficult to eradicate. One of the interesting things about the plant is that if left alone it grows fairly tall but if you mow it the plant changes its growth habit and spreads closer to the ground, becoming almost flat.

Squirreltail (Elymus elymoides)
Squirreltail and foxtails are sometimes confused. Once the seedheads start to dry it is easy to see the difference (see pictures). Squirreltail is actually a species of wild rye. It is a native to most of North America west of the Mississippi. Remarkably tolerant of a variety of conditions, it can be found from alpine areas all the way to desert scrub and valley grasslands.

The plant is a short-lived perennial bunch grass that grows to nearly two feet tall. The grass is considered good forage for sheep in the winter when it is short and green but as it ages it becomes less...
palatable. Wildlife also use it, including deer, antelope, squirrels and jackrabbits. It can even out-compete more invasive grasses. To top it off, it is one of the most fire resistant native bunchgrasses. So why is it considered a weed? It is those seedheads again. The long sharp awns that develop can hurt grazing animals and your pets. It’s one that is better in the wild than in your yard.

**Prostrate Knotweed (Polygonum aviculare)**

When you see the words “prostrate knotweed” I would guess that nothing really springs to mind but if you saw it you would recognize it as one of those weeds that is so common you would wonder why you didn’t know its name. Probably because it isn’t as difficult to control as some others. Knotweed is frequently found along sidewalks, in turf or wherever turf is stressed or less vigorous. You will often see it growing in the cracks of sidewalks and driveways. This plant is very hardy and loves dry compacted soils and areas of excessive foot traffic. It forms mats of tough wiry stems and leaves. The plant produces chemicals that will inhibit growth of other plants. (A similar-looking plant produces a milky sap when you break the stem; this one does not.) The flowers are very tiny just showing as small white dots where the leaf meets the stem. They are prolific seed producers. This species is an annual and will disappear when the weather produces a hard frost.

Knotweed can serve as a host to some diseases, including powdery mildew, and is thought to cause liver disease in grazing animals although that has not been confirmed.

If you have a problem with this plant in your grass, annual core aeration in the spring or fall will reduce the infestation. Pre-emergent herbicides can work also if applied in late fall/winter. Control can also include hoeing or rototilling and hand pulling. Since the plant doesn’t grow well or germinate in the shade, thick mulches will help slow down the spread of the plant.

**Prostrate & Spotted Spurge (Chamaesyce sp.)**

This weed belongs to the family of Euphorbeacea, the same family as poinsettias. They are commonly referred to as spurge. The word spurge comes from Middle English/Old French “spurge” which means “to purge.” The milky sap of these plants was used as a purgative.

These look similar to prostrate knotweed but when you break the stems they will exude a milky sap—an easy way to tell them apart. They form a dense dark mat.

The flowers are tiny and pink or white and form in clusters. There are three species that are common: Prostrate and spotted spurge, *C.maculata* (once considered two species, now thought to be one, even though spotted spurge has a large purple spot on its leaves and prostrate does not). Spotted spurge is the one I seem to have in my yard. Ridge-seeded spurge (*C. glyptosperma*) has entire leaf margins and ridged seeds. Creeping spurge (*C. serpens*) has smaller gray-green leaves. While these plants are easy to control, the sap can irritate the skin and cause a rash similar to poison ivy. Use gloves if you are sensitive to such things.

These plants have a fondness for the cracks of sidewalks. The seeds will sprout from temperatures that range from 60 degrees to 100 degrees but prefer 75 to 85. They grow quickly and can grow a tap root that reaches two feet in depth, making them extremely drought tolerant. Plants can produce seeds as soon as five weeks after germination. They can produce two to three generations per season and will continue to produce seed until the first frost. Each plant is capable of producing several thousand seeds. The seeds are sticky and can adhere to animal feet, bird feet and vehicles. You might be spreading them around your neighborhood just by taking a walk. Birds also eat the seeds and disperse the seeds in their droppings.

So why are they considered a weed? The sap can be irritating and in grazing animals can cause intestinal problems and blistering of the mouth, eyes and skin. Spurge also serves as hosts to a variety of insect pests and fungi that will attack some crops. Because of its tremendous seed production it can also be invasive.
Another year is about to end and so I would like to take the time to say thanks to those who have helped with the newsletter this year. Some like my primary editors have the difficult task of figuring out what I am trying to say and deal with my exuberant comma habit. So thanks to Pam Bowman and Marilyn Perkins for making me appear smarter than I am.

Thanks to Mary Barnes for her general help over the year and work in finding the tiny details that need a final correction before the newsletter is sent out.

Steve McIntyre and the members of the Public Relations committee have also helped by providing me with pictures and articles on Master Gardener activities, meeting and speaker information, so thanks for your help this year.

Thanks to everyone at the Cooperative Extension offices. Jeff for giving me the freedom to do what I want to do and providing advice and answers to my question. Karen Pizzuto, Pam Denny and Lisa Gerber for helping me when I need it.

Special thanks to those who have actually written something for the newsletter. I am sorry I don’t have a list but your work is GREATLY appreciated.

Last, but not least, as they say, thanks to those who have come up with ideas for articles. When my imagination fails me, I need you most of all. Without those ideas you wouldn’t have read about tortoise beetles and in this month’s newsletter, Aguaponics.

As usual I goof off in December, the time I would use to do the January newsletter, so the next newsletter won’t be out until February 1. Until then, have fun, enjoy the holidays and start planning your garden for spring.
Aquaponics

by Nora Graf

You might have heard about aquaponics. It is the combination of raising fish and growing plants combined into one system. The system works by moving water with all its nutrients from the excretions of fish into a hydroponic system where the fish nutrients feed the plants. The water from the plants is then cycled back to the fish.

Aztecs had a system called chinampas that is considered the first form of aquaponics. Plants were raised on islands in shallow water and waste material from canals was used to irrigate the plants. Rice paddies can be used as a form of aquaculture where fish, eels and snails are raised in the paddies along with the rice. Modern systems are a bit more high tech. Research on such systems started in Canada in the 1990’s. Over time aquaponics moved to a number of countries like Bangladesh and Barbados, places that were trying to feed their citizens without having to import food. Outdoor systems continued to spread but recently the systems have moved indoors. You may have heard about plans to create vertical farms in cities. These are basically indoor aquaponics systems.

There are upfront costs and concerns when creating an aquaponics system. There are five key elements: water, oxygen, light, feed (for fish) and electricity for the pumps, filters and oxygenators.

Some of the items you will need:

- Tanks for raising and feeding fish.
- Settling basin to catch uneaten food, biofilms and fine particulates.
- Bio filters used to convert ammonia into nitrates.
- Sump where the lowest point in the system where water flows to and from and is pumped back to the rearing tanks.
- You will also need fish. Most of the places recommended tilapia or perch.

As you might have figured out by now it is a fairly technical operation. You can set up complex systems with lots of equipment and technical expertise needed. There are also smaller systems more suited to small farmers but all require pumping water from one location to another and a filtering system between the plants and fish. One system involves using gravity to move water from the fish tanks to a gravel bed where bacteria break down the toxic ammonia in the fish waste to nitrite and then to nitrogen which the plants can use. Along with the bacteria the gravel bed can support watercress which is a secondary way to filter the water. For the indoor gardener there is even a system using a home aquarium tank.

From the gravel bed, water is pumped to the plant beds where a variety of crops can be grown. The plants are grown in a special media which could be rockwool, coir, rocks, and expanded clay. From the growing beds the water is pumped back to the fish tanks.

Some of the problems with aquaponics:

Algae: Where there is water, there is algae. Algae attracts bugs. Fungus gnats can severely damage or kill the root systems of your plants. The nutrient tank needs to be made of a dark material and you will need a lid to limit light. Lightproof is the goal.

Leaks: Where there is water and pipes there will be leaks. High water pressure is one of the bigger problems. You want a system with a low water pressure pump. Make sure the entire system is big enough to handle all the water.

Clogging: Where there are drips or spray systems there will be clogging. Keep your filters and system clean. One source said to check emitters two or three times a day for clogging. HHhhmm, seems to be very labor intensive.
Growing Mediums: Some don’t last forever and rockwool should be replaced at the start of a new growing season. Pellets or lava rock are reusable.

Water Temperature: Fish can be finicky. Make sure you keep them comfortable.

Fish Crowding: More fish isn’t necessarily better. Like most living creatures if there is overcrowding larger fish will start to eat smaller fish. Too many fish will also put too much waste in the water.

Ammonia: Test, test, test. Too much ammonia in the water kills fish.

Access to fish tank: Putting plants over the fish tanks is one way of setting up your system but that means you will have less access to the fish. You need to have plenty of access to change water if necessary, catch the fish and have access to any plumbing.

Water pH: Plants and fish are quickly affected by the pH of the water. Test!

I’ve barely grazed the surface on aquaponics and really highlighted the challenges. These systems can be complex and labor intensive but are doable. Before you plunge into one it would be wise to do considerable research to see what the costs and time commitments are. To get you started try the resources listed below. There is a lot of information online. These two could help get you started.

For more information:
This is a forum, community page that you can use to find out information; it includes a blog, videos, events, etc. You will have to sign up to access parts of the site but there doesn’t appear to be any charge. There is an Arizona group within the forum.
http://community.theaquaponicsource.com/

I am not recommending their system, that is for you to decide, but they have a lot of information available on different systems—how to start up and run systems and general maintenance.
http://www.backyardaquaponics.com/guide-to-aquaponics/what-is-aquaponics/

The holiday season—good food, friends and families and OH? NO! SEED CATALOGS, NURSERY CATALOGS, GARDENING SUPPLY CATALOGS!!! Nothing will drive a gardener to madness quicker than delving into those glossy wonders. Snow on the ground, at least in some parts of the county, (well this was written in 1994; a lot has changed since then), leafless branches, defenseless little birds shivering in the cold and the mailbox is being deluged with color, new varieties and dreams.

Start planning the garden now. Get those orders ready; obviously spring is right around the corner. Well maybe if you live in Phoenix but we have a few more weeks before spring is upon us. So maybe we should stop and take a closer look at the catalogs and what they are saying. Keep in mind they all have the world’s best tomatoes and the pinkest carnations and reddest beets and the best, YES!, absolutely the best tasting corn in the whole world, which of course supersedes the best tasting corn in the whole world that they offered last year.

There are hundreds of catalogs out there and we all have our favorites and you will just have to send away for them and try them out. Talk to fellow gardeners. Some catalogs are better than others. Whichever ones you decide to order from, read the descriptions carefully. Most will list the length of time in days it takes the plant from germination to harvest or flowering. Don’t buy it unless, you are good at extending your season, if the seed needs 100 days and you only have a growing season of 90 days. They may also include information on sowing. Read carefully, some seeds need special conditions to germinate to harvest or flowering. Don’t buy it unless, you are good at extending your season, if the seed needs 100 days and you only have a growing season of 90 days. They may also include information on sowing. Read carefully, some seeds need special conditions to germinate, while others prefer just being tossed onto the ground.

Size is a factor to consider when planning the garden. Don’t buy or grow plants that may exceed the space you have available; something is going to lose
Beware of all the eloquent descriptive words. What you want to look for is the size, how long it takes to bring to flower or harvest, conditions necessary for germination, shade or sun.

Some companies are better at giving out this information. Some only provide it in the catalog, so when you receive your seeds there is nothing on the package as to planting information (one of my pet peeves). If you are ordering plants, some companies will not ship to Arizona. Always check before mailing off the order to avoid disappointment.

The advantage of catalogs is that they bring a wonderful variety of plants to the garden that are never seen in local nurseries. So once in awhile avoid all the above advice, splurge and try something new and unusual and possibly wonderful.

(Ed. note: Since I wrote this article most people have moved their shopping to the internet. Many catalogs have disappeared due to the consolidation of the seed industry, the fact it’s just cheaper to produce on online catalog vs. a paper one and just that farming is a tough business. It’s rare to see snow in December now and we seem to be relying more and more on buying plants vs. starting seeds. I miss browsing through those catalogs, though, and one of these days I am going to start my plants from seeds again.)

Warming Body & Soul

I love hearty soups and winter is a good time to enjoy them. I also like trying new things so don’t always make the tried and true. This Thai inspired soup might be good for a cold winter’s night.

Thai Coconut Chicken Soup

Recipe courtesy Tyler Florence
Total Time: 45 min
Yield: 8 servings

Ingredients
4 cups chicken stock
3 kaffir lime leaves, fresh or dried, hand torn
2 small Thai chiles, halved lengthwise
2 cloves garlic, crushed
One 3-inch piece fresh ginger, peeled and cut into 4 chunks
1 stalk lemongrass (white part only), cracked open with the flat side of a knife
1 1/2 cups shredded cooked chicken
One 13-ounce can unsweetened coconut milk
One 8-ounce can straw mushrooms, rinsed
2 tablespoons Thai fish sauce (nam pla)
1 1/2 teaspoons sugar
Juice of 4 limes
Kosher salt and freshly ground black pepper
1/4 cup chopped fresh cilantro leaves, for garnish

Directions
Bring the stock to a boil over medium heat in a soup pot. Add the lime leaves, chiles, garlic, ginger and lemongrass. Lower the heat to medium-low; cover the pot and gently simmer to let the spices infuse the broth, about 10 minutes.

Uncover the pot and stir in the chicken, coconut milk, mushrooms, fish sauce, sugar and lime juice. Simmer to heat the chicken through, about 5 minutes. Sprinkle with salt and pepper. Ladle the soup into a soup tureen or individual serving bowls. Garnish with the cilantro. Be careful to avoid chewing the lemongrass, ginger or lime leaves.

Cook’s Note: Lemongrass imparts a delicate citrusy flavor and aroma, but if you can’t find lemongrass, use equal parts lemon peel and ginger. Kaffir lime is gently limey with lots of aroma, but you can substitute lime peel if you can’t find it.
FROM THE EDITOR: Please send or email articles and announcements to the address below. All articles must be in my hands by the 10th of the month. Short announcements (no more than 2 or 3 lines) will be accepted until the 25th.

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MG NEWSLETTER

Next Meeting

January 15, 6:30pm, Prescott