



The Growing Zone

A Newsletter for Gardeners of all Levels

By Helena Area Master Gardeners

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Drip Irrigation 101

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Joy Lewis

Drip irrigation is a low-flow system for watering plants that delivers water precisely where you want it. It has many great advantages in a garden and yard setting, beginning with water conservation. You get the water where you need it the most, at the root zone, and there's no waste, so you'll also notice it when you get your water bill. Drip systems also reduce weed growth because you're not watering the area between your plants. It reduces plant stress because the plant is getting consistent moisture. You can custom fit your drip system to just about any garden. The most expensive part of the system is a good battery-operated electronic timer, which takes the worry out of finding the time to water everything or finding someone to water for you while you're away.

Most garden centers and nurseries sell drip irrigation kits to help get you started. Start small so you can learn the basics without spending too much money. Kits typically start at \$12 to \$19 for smaller projects. You can go online or to your local store to learn about different products, system set-ups and start from scratch.

Drip system anatomy starts with understanding that low-flow drip systems work best at 20-30 psi or pounds per square inch. The psi coming from your household faucets can run from 50-70psi. In most cases you will need to install a vacuum breaker or back flow preventer, pressure regulator or reducer, tubing adaptor and hose connector before you hook to your main drip tubing. Generally speaking your outside hose bib is 3/4 inch male thread. Next comes the irrigation tubing or tape (generally black PVC) and fittings to help distribute the water. Add to that drip emitters, micro jet sprayers and in some cases hose drip line that attaches to the main drip line itself. Don't forget the hand-held hole punch you'll need to poke holes in your tubing for attaching different



Emitter

emitters and a tube cutter or utility knife for cutting the PVC tubing. Sharp utility scissors work well too.

It's a good idea to make a sketch of the garden area you want to water and lay out the drip line in your drawing. For beds that run along foundation walls it's easy to connect systems, especially if a hose bib is nearby. For beds that sit alone you might have to dig a shallow trench to bury a main feed pipe to the area. Try to group irrigation runs with plants that require the same amount of water. For example, Xeric or low water plantings can share one zone or run. Shade plants can share another. Trees and shrubs should have their own zones.

Start small and experiment. It's not absolutely necessary to install an electric timer if you want to stay more low-tech. Go online to get some good ideas about different designs and products.

A much less expensive method is to use soaker hoses. Black soaker hoses are much like regular hoses and can be connected together. Weave them through and around the plants in your beds. Find them at any garden center.



Drip irrigation in the garden
Image from <http://www.savewater.com.au/>



Plastic Mulch

Judy Halm

Natural Mulch

Gardeners and homeowners use mulch around desirable plants to prevent weed growth and to conserve moisture in the soil. Mulches also help to maintain a more uniform soil temperature, help prevent compacting of the soil, and prevent soil-borne diseases from splashing up onto the plants. Useful natural materials include grass clippings, leaves, straw, wood chips or shredded bark and paper, although they may not always be easily available. Natural materials will eventually biodegrade into the soil.



Photo courtesy Washington State Extension

Plastic Mulch

Since the 1950s, gardeners and commercial producers have had another mulch product to consider: plastic mulch. Thanks to the petroleum industry, plastic mulches have become readily available and reasonably inexpensive. They are used on hundreds of thousands of acres of land, for crops such as tomatoes, peppers, eggplant, cucumbers, squash, onion, potato and others, and are used in horticultural applications around many homes. Plastic mulches have many of the same advantages as natural mulches. They also allow earlier planting of crops, as they help the soil warm earlier in the spring.

Since plastic mulch prevents water from reaching the soil, irrigation must be used along with the mulch. When used in conjunction with drip irrigation, plastic mulch can greatly reduce the amount of water needed to help plants thrive.

Because they are petroleum based, plastic mulches do not biodegrade in the soil, but instead break down into tiny pieces that will exist in the soil for years. Therefore, plastic mulches must be removed from the garden or field before they begin to degrade and must be disposed of properly. At present there are few opportunities to recycle plastic mulch; those that do exist are expensive.

Biodegradable Option

Biodegradable mulches made out of plant starches are available, but tend to be more expensive than regular plastic mulch. These mulches can be tilled into the soil and are broken down by soil microorganisms. However, the starches used in the manufacture of biodegradable mulch

may come from genetically modified organisms (GMOs) such as corn. Many gardeners and farmers do not want GMO products in their food production plots.

Plastic mulches have the ability to reflect, absorb, and transmit light. They were initially only available in black and clear forms, but are now available in a variety of colors including white, red, blue, olive green, and reflective silver. Studies have indicated that colored mulches can increase yield in a variety of crops. See the table below for more information.

Some colored mulches formulated with special coatings are sold as Selective Reflective Mulch or IRT (Infra-red transmitting), meaning that the mulch reflects or transmits specific wavelengths of light. For IRT mulches, only infra-red wavelengths are transmitted through the mulch into the soil, resulting in elevated soil temperatures without promoting weed growth under the mulch. Silver colored reflective mulch has been shown to interfere with certain plant pests.

Plastic mulches can be a useful gardening tool, provided gardeners are aware of the advantages and disadvantages of their use and act accordingly.

Mulch Color	Crop or Use
Black	Weed suppression, soil warming, potato, onion
Clear	Soil heating
Red	Tomato, eggplant, onion, potato
Blue, dark	Cucumber, summer squash, Cantaloupe
Silver	Peppers, onions
Green IRT	Cantaloupe

Watering Lawns and Trees

Judy Halm

Spring rains have come and gone, the leaves are finally appearing on the trees and shrubs, and the lawn is that bright, rich green that everyone loves. After the underground sprinkler timers are programmed, the yard is good to go for the summer, right?

Maybe not. If you are watering your lawn, shrubs and trees for the same length of time, with the same amount of water, you may be causing water stress to one or more of your growing plants. Grass, shrubs and trees have different water requirements, depending on the depth of their root zone system, the soil in which they are growing, and the species of plant.

Watering Lawns

Lawns grasses are generally Kentucky blue grass and fescue, with a root system that extends about six inches below the surface. They need proper watering during the hot summer months in order to remain green. Many people water too much, too shallowly and too frequently. This keeps the upper layer of the soil near saturation, potentially reducing the amount of oxygen available to the roots, which encourages shallow root growth, producing weak turf that is vulnerable to damage from drought, traffic and pests. It also encourages weedy grasses such as annual bluegrass and roughstalk bluegrass that prefer moist conditions.

Ideally, water lawns with a slow, steady stream until the soil is damp to a depth of about 6 inches. The frequency of watering will depend on the species of grass, the type of soil (sandy, loam or clay), the moisture already in the soil from rain, and how well the soil holds moisture. Apply about 1 inch of water per week during the early spring, 1½ inches per week in late spring, 2 to 2½ inches per week in the summer, depending on the temperature, and 1 inch per week in the fall. Water only when the temperature is rising, in the early morning. Watering during the heat of the day wastes water through excess evaporation and watering at night can increase the chances of disease in your lawn.

Watering Trees and Shrubs

Plants have a root zone, the soil surrounding the plant's roots, from which the plant draws moisture and nutrients. Trees and shrubs shed rain water from their canopies to the "drip line," the outer reaches of the leaves. Think of a green umbrella over the plant, created by leaves and branches. The outer edge is the drip line.

The roots of trees and shrubs extend well past the drip line, making their root zone very large. The most active water absorption area is at the drip line and beyond, not close to the trunk. Water at the drip line, not near the trunk of the plant. Generally, the roots spread 1½ to 4 times as wide as the plant's canopy.

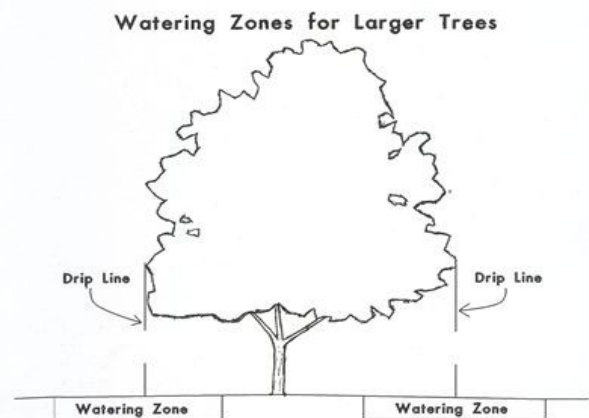
Typical Root Zone Depth for Mature Plants:

Lawn and Garden 6 - 12"
Shrubs 12 - 24"
Trees 18 - 36"

Water to a depth of 12 to 24 inches for shrubs, and 18 to 36 inches for trees. You can push a smooth metal rod into the ground when you water; the rod will move easily through wet soil and will become difficult to push once it encounters dry ground. Rocky ground will present challenges to this method of measurement.

Water needs of plants will vary greatly with plant species. Trees and shrubs that grow naturally along water ways will need much more water than plants which typically grow in arid regions. Know the plants in your landscape, and water them accordingly.

If trees are in a lawn, water them separately from the grass. Deep watering promotes deep rooting of trees and shrubs. Deep root systems will keep the shrubs and trees healthy and will help anchor them against wind damage.



Drawing courtesy City of Cheyenne, WY

Saving the Rain: barrel-by-barrel

Joy Lewis

Saving water is always a smart idea because it conserves a valuable resource and keeps our own pockets a little greener. Along with water saving devices on indoor faucets or underground sprinkling systems, rain barrels positioned under gutter downspouts can significantly decrease your water bill and provide chlorine-free water to potted plants, flower beds or lawns. An added benefit is that plants love rainwater.

A rain barrel collection system can be designed to fit just about any roof gutter and downspout application. Wood barrels blend in and provide a “rustic” look. Plastic food-grade barrels are less expensive and can be painted to match the background or your house color. Use a plastic priming paint and topcoat with a good latex

paint. Don’t forget to wash the barrels’ exterior and rough up the surface with sandpaper to ensure good paint adherence. It’s also a good idea to wash out any residue from the interior before it fills with rainwater. For rain barrel system information and design plans go to www.rainbarrelguide.com. Here, and at other sites, you will learn about how to redirect water overflow, keep debris out of your barrel, and prevent mosquitoes from breeding in standing water.

A handy homeowner can install a rain barrel for \$50-to-\$75 using food grade plastic barrels. Professional installation using fancier hardwood barrels can run \$200 or more. Purchase rain barrels at your local Ranch and Supply or garden center in the spring, or search for barrels online.



Photo courtesy Tennessee Hometown Radio Network

Succession Planting

Joy Lewis

The best way to keep vegetables coming during your growing season is to consider successive plantings. Successive planting encompasses two ideas; planting the same vegetables two and three times in a growing season or, after one vegetable crop has reached its maturity and has been harvested, planting a different crop in its place. Successive plantings work well with a variety of lettuces and other greens including spinach, arugula, orach, chard and kale. Radishes, because of their quick maturation rates are another great vegetable to sow one or more times in your garden. Carrots can also be sown successively. Plant carrots as early as possible in the spring to harvest by late summer to-early-fall. Plant the next crop two to-three-weeks later for harvest in late fall or early winter. A thick straw mulch layer placed over them will keep the ground and the carrots from freezing when temperatures start to plummet again. There’s nothing better than pulling some carrots out of the ground in late November and eating them raw!

Make sure that you consider your growing zone to determine if successive planting is a viable option, and where in your garden you get the most and least amount of sun. The rule of thumb is to sow rows of leafy green seeds and then two to-three-weeks later sow more leafy green seeds in a different area of your garden. Consider planting your leafy green seeds early in the spring where you get the most sun in your garden since temperatures tend to stay fairly cool. Then when it comes time to sow the next seeds try to pick a place that gets early morning sun and late afternoon shade. Most leafy greens thrive better in cooler temperatures because these conditions keep them from bolting or going to seed so quickly and losing their good flavor. Another good way to mimic these conditions is by using shade cloth draped over hoops frames in your garden. This keeps the heat of direct sunlight from falling on your new plants. Make sure to leave a one to-two-foot gap between the cloth and the ground to promote air circulation. Shade cloth comes in different densities and typically a shade density of 60 percent is good for growing greens and will prevent the plants from becoming too leggy.

Gardening Calendar

Conditions during each spring in your location will determine the actual timing of your garden work. If you have questions regarding the timing of garden activities in your area, please feel free to ask a Master Gardener at HelenaMasterGardeners@hotmail.com.

June

- ♣ Power rake, aerate and fertilize lawns if you haven't in late May.
- ♣ Apply compost or fertilizer early before planting flowers – apply foliar fertilizers in the cool of the mornings or in the evenings.
- ♣ Plant annuals in planters and flower beds – fill in around perennials and by spent flowering bulbs.
- ♣ If you haven't already; Plant lettuce greens, spinach, arugula, chard, kale and radishes.
- ♣ Direct seed carrots and beets.
- ♣ Cover new growth if frost suspected.
- ♣ Check soils for moisture content – if dry 2-to-3-inches down, water.
- ♣ Consider planting another row of leafy greens and radishes later in the month.
- ♣ Install or hook up drip irrigation systems.
- ♣ Install rain barrels under gutter down spouts.
- ♣ Plant perennials with a water soluble root booster to help get them established.
- ♣ Plant perennial shrubs and trees now before the heat of summer hits.



July

- ♣ Separate and transplant iris after blooming is finished.
- ♣ Thin out direct seeded leafy greens. Follow directions on packet for establishing individual heads or leave partially thinned for harvest by the leaf.
- ♣ As plants mature consider mulching with straw, newspaper, cardboard or wood chips to conserve water, provide more even moisture and less work for you.
- ♣ Start training vining plants like peas or clematis around poles or through wire mesh or along string.
- ♣ Start routinely checking for aphids, mites, and powdery mildew – use Integrated Pest Management (IPM) techniques when managing pests.
- ♣ Water on a consistent schedule as weather gets warmer, especially, making sure container plantings, stay moist.
- ♣ Fertilize container flowers every two weeks.
- ♣ Start deadheading or snipping off spent flowers to encourage new flower growth.



How do you know you're a Master Gardener?

There is a decorative compost container on your kitchen counter.

You would rather go to a nursery to shop than a clothing store.

You prefer gardening to watching television.

You plan vacation trips to arboretums and public parks.

Blossom End Rot

Judy Halm

Gardeners who grow tomatoes, peppers or eggplant may have experienced a disturbing development in the partly-grown fruits of these plants. It looks like a disease is attacking the fruit, rotting it from the blossom end up.

Blossom end rot is not a plant disease but rather is a physiological disorder which affects tomatoes, peppers, eggplant and other fruit-bearing plants. It may affect both greenhouse and field grown plants. The disorder can occur during any growth stage of the fruit.

SYMPTOMS

The first symptom of the disorder is a slight, water-soaked discoloration on the blossom end (opposite of the stem) of the fruit. As the lesions enlarge, turning leathery and dark brown or black, they often become sunken into the fruit. Bacteria and fungi may invade the lesion at this point, producing a soft, watery rot.

CAUSE and CONTROL

Blossom-end rot is caused by a shortage of calcium in the young fruit. Calcium is required in relatively large concentrations for normal cell growth. When a rapidly growing fruit is deprived of necessary calcium, the tissues break down, leaving the characteristic dry, sunken lesion at the blossom end.

Calcium is not a highly mobile element in the plant, and is taken up only as water is pulled from the roots of the plant to the leaves during transpiration.

Several factors can lead to a shortage of available calcium. Improper watering is a major contributor to blossom end rot. During the day, the pores (stoma) on the leaves are open and water transpires from them, drawing moisture and calcium through the roots and up into the

leaves. Since the fruit does not lose much water by transpiration, they receive little of the calcium-containing water. At night, when the leaf stoma close, root pressure forces water into the plant, and the developing fruit get their share of calcium and other nutrients. If the plant is water stressed (lacks water) at night, the system fails and the fruit receive very little calcium, causing blossom-end rot. Prevent water stress by infrequent but deep watering of the plant and using mulch around the plant base to prevent water evaporation and keep the soil evenly moist. Avoid overwatering, especially in heavy clay soils.

Lack of calcium in the soil can be another factor leading to a shortage of available calcium, although most Montana soils contain sufficient calcium for plant growth. A soil test can determine the amount of available calcium in the soil; contact your local County Extension Agent for more information about soil testing. Most laboratories will provide instructions for the rates of application of calcium compounds for soil found to be deficient in calcium.

Excess application of other fertilizers containing ammonium, potassium and magnesium can interfere with calcium uptake by plants.

Root damage caused by improper cultivation practices may also lead to blossom end rot. Hoeing or cultivating too close to plant roots may damage them, reducing their ability to take up water, calcium and other nutrients. Pull weeds by hand near plants, or use mulch to keep weeds down.

Avoid rapid or severe hardening of transplants before they are placed in the garden. Transplants should be set

out when the soil is warm enough to promote rapid growth.

Although blossom end rot does not spread to other plants, remove and dispose of affected fruits, since secondary infections of bacteria or fungi may spread to other plants.



Blossom end rot of peppers

Photo by E. Maynard, Purdue University



Blossom end rot of tomatoes

What do you get if you divide the circumference of a pumpkin by its diameter? **Pumpkin pi !**

A Recipe for Compost – Bon Appétit!

Kathy O'Hern

Do you want to make some compost for your garden? It turns out that the best compost for a particular application, such as a vegetable garden, is compost made from the residuals of that garden. Vegetable to vegetables, as opposed to wood shavings to vegetables - that makes sense. However, a mix of materials is necessary, so use what is available.

To make this compost you'll need FOUR ingredients:

Carbon-based, usually brown, material (dry leaves, wood shavings, straw)

Nitrogen-based, usually green, material (fresh lawn clippings, vegetable/fruit scraps, green leaves, fresh manure)

Together these two ingredients are referred to as the Carbon to Nitrogen Ratio, or C:N.

Water
Oxygen

C:N Ratio. Using the right combination of carbon (C) and nitrogen (N) materials is important. In active compost you "cultivate" a colony of microorganisms that will transform the compostable materials into a useable soil amendment. The microorganisms need both C and N to thrive; carbon for energy and nitrogen for protein synthesis. For every one unit of nitrogen used by the microorganism they consume about 30 units of carbon. So in order to keep them happy, multiplying, and working efficiently they need to be supplied with a mixture that is about 30 parts of carbon to 1 part of nitrogen, or 30:1.

If you can determine the C:N ratio of your available materials you can do a little math to get to the desired 30:1 ratio. A variety of C:N tables and compost calculators can be located on the internet.

Water. Too little moisture is the main reason for failed compost, especially in arid Montana. The microorganisms must have water to survive and grow. Too little water slows decomposition and prevents the pile from heating. Use the "wet sponge" method; when the mixed materials are about as wet as a wrung-out sponge, the moisture level is near ideal.

Oxygen. Like most living things, the microbes need oxygen to survive. To supply oxygen to the microbes, the pile needs porosity – spaces for the air to flow. A fluffy pile has plenty of spaces for air to move about, while a flat, matted pile of grass clippings does not. All piles will compress during the composting process. Occasionally turning your pile re-infuses the pile with air, and supplies necessary oxygen to the microorganisms.

Let the microbes do their work. The compost pile is a teeming microbial farm. Bacteria begin the process of decaying the organic materials. They are the first to break down plant tissue, and also the most numerous and effective composters. Fungi and protozoans follow the bacteria and later in the composting cycle, centipedes, millipedes, beetles and earthworms all do their part. This may take all summer, or over the course of a winter and spring. There will be a significant reduction in the size of the pile during this time.

Monitor the pile. Keep an eye, and nose, on the pile – too much C will result in a compost pile that takes a long time to break down and doesn't heat up well. Carbon-rich piles break down slowly because there's not enough nitrogen for the microbe population to expand. Piles with too much N tend to smell, because the excess nitrogen converts into an ammonia gas. Too much green material may result in a compost pile that is slimy and smelly, and that doesn't break down well. Don't give up; keep adjusting the mix until you get it right!

Location. Find a spot in your yard that is not in direct sunlight – summer sun will dry out the compost. The working pile will need water, so keep that in mind. Turning and mixing the compost will allow odors to escape; it won't be overly offensive, but be sensitive towards close neighbors.

Size of materials. In composting, size matters! The microbes work on the surface of the material, so chopping larger items is advantageous. Wood chippers a good tool to use to reduce material size before it goes into the compost pile.

Size of pile. The smallest size that will effectively compost is one cubic yard. If smaller, the pile will not have the mass necessary to generate heat.

What not to compost. Do not compost meat, bones, animal waste, or dairy products; these wastes may carry pathogens that may not be destroyed in the home compost process. Avoid adding diseased plants, seeded weeds, and plants treated with herbicides or pesticides to the compost pile.

An excellent MontGuide titled "Building Bins and Boxes for Yard Waste Compost" is available from your Extension agent; ask for publication SKU MT199204HR.

Other resources

<http://cwmi.css.cornell.edu/compostbrochure.pdf>

<http://www.howtocompost.org/>



Schutter Diagnostic Laboratory at Montana State University

Judy Halm

Gardeners, farmers and anyone else interested in growing plants in Montana have a powerful resource to assist them in growing the healthiest plants possible. Through their local County Extension Agents, plant growers have access to the Schutter Diagnostic Laboratory in Bozeman, Montana, for the identification of plants and plant pests.

Associated with Montana State University and the Cooperative Extension

Service, Schutter provides the identification of plants, plant diseases, turf and turf problems, insects and mushrooms. The laboratory also aids in the diagnosis of cultural problems and provides management recommendations for agricultural producers, homeowners and gardeners. Schutter utilizes a wide range of techniques for diagnosis, including visual identification, pathogen culture, microscopic identification, and biochemical detection. Early diagnosis of problems facilitates implementation of management strategies resulting in financial savings to producers.

If you experience unusual insects in your garden, wonder if the new plant growing in your flower bed is a flower or a weed, or notice one of your plants has mold on its stem, the Schutter Diagnostic Laboratory can help you find the answers. Contact your local Extension Agent to find out how to submit plant or plant pest samples, or for more information on the resources the Schutter Diagnostic Laboratory has to offer. You may also contact the laboratory directly at (406) 994-5150.

Ask the Experts

We all have questions about our gardens, lawns, trees, flowers or other landscape projects from time to time. Ever wish you could ask an expert in the field for answers to your questions? Here's your chance! In each issue of the newsletter we will answer one or more questions posed by our readers. Send in your questions to HelenaMasterGardeners@hotmail.com and we will pass the questions on to our expert panel for answers.



Brent Sarchet, Lewis & Clark County Extension Agent

Q. Why can't I order seed potatoes from out-of-state?

A. Montana is a big seed potato production state. Montana's seed potatoes are highly sought after. They are sent to many western states including Idaho, Oregon, Washington and into Canada. The reason they are so highly sought after is because our soil is currently free of potato Cyst Nematodes, *Globodera pallid*, which is a major pest of potato crops and other plants in the potato family. Soil infested with Cyst Nematodes can reduce yields by 80%. Consequently, Montana has laws that prevent seed potatoes from being sold into the state to reduce the risk of bringing in soil born pests like the Cyst Nematodes and other diseases like late blight and potato viruses. When you are looking for seed potatoes, only buy Montana Certified Seed potatoes. Support the local Montana farmers and help keep our soil productive for growing seed potatoes.

Q. How can I control knapweed?

A. There are many species of knapweed found in Montana. Russian knapweed (*Centaurea repens*), Spotted knapweed (*Centaurea stobebe* or *maculosa*) and Diffuse knapweed (*Centaurea diffusa*) are all priority 2B noxious weeds. Knapweed is a short-lived perennial. Successful control of any noxious weed involves utilizing many tools and not relying on one. Management options include: avoiding establishment with cultural practices, hand pulling, spot application with a non-selective herbicide such as glyphosate, or using a broadleaf herbicide such as 2,4-D and/or dicamba. Always remember to read the herbicide label and make sure the herbicide is labeled for controlling the type of knapweed you have. Biological control (using insects that feed on the knapweed) is another management option to use with one or several other management options. If your property allows, grazing with sheep and goats is an excellent way to manage knapweed. Regardless of what management options you decide to use, plan for the long term because you will never get all the knapweed con-

New gardeners learn by trowel and error.

Plant Profile: *Euphorbia* – Friend or Foe?

Connie Geiger

My parents used to grow a beautiful white and green variegated plant that they called snow-on-the-mountain. A few years back I saw it in a seed catalogue, where I learned its scientific name of *Euphorbia marginata*. We ordered seeds and grew them in our annual flower bed, and liked them so much we've ordered and grown them every year since. It is a nice accent in flower beds, adds a nice filler as a cut flower in bouquets, and has a very long vase life.



I wanted to know more about this unusual plant, so I researched it online, as well as in a variety of gardening books, and made some interesting discoveries.

- ♣ *E. marginata* is a native of Montana, and was collected by the Lewis and Clark expedition
- ♣ A common euphorbia we all recognize, particularly during every Christmas season, is poinsettia (*E. pulcherrima*)
- ♣ Another relative is *E. esula*, the dreaded leafy spurge!



Euphorbias are a large and diverse genus of plants in the Euphorbiaceae family, commonly known as the Spurge family. They include a vast range of hardy perennial and annual plants. Many species are succulents or cactus-like, usually found in the Mediterranean or in Africa; others can be either deciduous or evergreen; many in tropical areas can grow as large as shrubs and trees.

- ♣ Usually monoecious, with complex but inconspicuous unisexual flowers surrounded by modified leaves (bracts) and grouped in a cluster;
- ♣ White milky latex sap containing terpen esters that can irritate skin or eyes

(use caution when working around the plants).

- ♣ **History:** "Spurge" derives from the Old French meaning "to purge"; most likely because the sap was used as a purgative or laxative. Euphorbia was likely named for the Greek physician Euphorbus, who used a spurge as an herbal remedy to cure King Juba II of Numidia before the first century.

- ♣ **Usage:** Medicines, glues, paints; and as ornamental plants. *E. pekinensis* is one of the fundamental herbs used in traditional Chinese medicine.

- ♣ Several species are essential food plants for butterflies and moths.

- ♣ **Planting:** Direct seed after danger of frost, in well-drained soil in a sunny location. Many species are grown best in Zone 5 or above, but some can be grown in our climate (either as annuals or perennials).

- ♣ For cut flowers, harvest when the upper leaves/bracts are pure white and before the flowers are fully open. After cutting plunge the cut stems in tepid water for a few minutes to stop the sap from bleeding.

Leafy Spurge (*E. esula*):

Euphorbias have their dark side. *E. esula* is a noxious and invasive species introduced from Europe as a seed impurity in the 1800s and has spread throughout North America, taking over vast areas of Montana. By shading other plants, usurping limited moisture and nutrients, and due to toxins in the plant, it drives out native species. It is poisonous to most grazing animals so they naturally avoid it. It frequently takes hold in disturbed or cultivated

ground, spreading by its deep network of rhizomous roots and by seeds that remain viable for up to 8 years. Once established, it thrives in dry conditions. Exploding seed capsules can spread seed 15 feet. It can spread vegetatively several feet per year.

This perennial plant has the characteristic inconspicuous flowers, which are greenish/yellow set in pairs of heart shaped bright yellow-green bracts, in umbrella-like clusters. The yellow bracts appear in late May or early June. The actual flowers do not develop until mid-June. Mature stems are often red at the base, and emanate from a vertical root that can extend as deep as 20 feet under ground. Be sure to wear gloves and long sleeves when pulling or working around this plant due to the toxic milky sap.

Controls: 2,4,D or Roundup can be applied in June or in early-mid September. However, they have a limited impact, and Roundup will kill all other plants, leaving the ground open to other weeds. Maintaining native species is an important deterrent to leafy spurge. Grazing sheep or goats, and using biological control has shown to be effective. Ultimately the most effective control of leafy spurge is an integrated combination of biological, chemical, and cultural practices.



E. esula, Leafy Spurge

Are Rapitest® Soil Kits Accurate at Testing Soil Nutrient Levels?

Brent Sarchet

One of the objectives of The Growing Zone Newsletter is to provide information to the public that they might not find elsewhere. A regular feature of The Growing Zone Newsletter will be garden product testing. The Growing Zone crew will be testing gardening products to confirm if the products do what they are claimed to do. The first product we tested is the Rapitest® soil testing kit. Are they accurate when compared to soil laboratory results?

The table below shows the results. Soil samples were collected from 5 different gardens. The samples were evenly divided. Half of each sample was sent to a soil laboratory and the other half was used to test with the Rapitest® soil testing kit. When com-

paring the results, the Rapitest® was 40% accurate for nitrogen, 100% accurate for phosphorus, 100% accurate for potassium and 80% accurate for pH. The Rapitest® does not provide quantitative results like the laboratory will provide, so there is some guessing involved in determining how much fertilizer to add to your soil. Additionally, the Rapitest® does not provide additional information such as the percent organic matter or the texture of the soil.

What does this mean? While this was a very simple comparison study, which needs to be replicated additional times before any concrete assumptions can be made, it does appear that the Rapitest® soil testing kits may be useful especially for monitoring your nutrient levels. Overall the Rapitest® was 80% accurate when compared to the laboratory

results. The Rapitest® or similar products may be useful in testing soil every other year, but a soil laboratory should still be used at least every other year or every third year. The most limiting nutrient in the soils in the Helena area is nitrogen. Our soils typically already have high levels of phosphorus, potassium and a high pH due to the parent material that made them. The Rapitest® was only 40% accurate when testing for nitrogen, so if you are using it or a similar product, test for nitrogen several times to reassure accuracy. Also make sure that the sample you take is a representative sample. Without a representative sample, your results will not be representative of your soil regardless of what testing method you use.

	Garden	Nitrogen	Phosphorus	Potassium	pH	% Organic Matter	Texture
Laboratory	#1	9 ppm (very low)	90 ppm (very high)	508 ppm (high)	7.8	5.1 (high)	Loam
Rapitest®	#1	Adequate	Surplus	Surplus	6.5	n/a	n/a
Laboratory	#2	47 ppm (medium)	115 ppm (very high)	521 ppm (high)	7	5.1 (high)	Loam
Rapitest®	# 2	Surplus	Sufficient	Sufficient	7	n/a	n/a
Laboratory	#3	18 ppm (very low)	200 ppm (excessive)	883 ppm (very high)	7.9	5.3 (high)	Loam
Rapitest®	#3	Deficient	Surplus	Surplus	7.5 +	n/a	n/a
Laboratory	#4	12 ppm (very low)	72 ppm (very high)	347 ppm (high)	7.9	5.7 (high)	Loam
Rapitest®	#4	Deficient	Surplus	Surplus	7.5	n/a	n/a
Laboratory	#5	24 ppm (very low)	200+ (excessive)	1459 ppm (excessive)	8.2	5.7+	Loam
Rapitest®	#5	Adequate	Surplus	Surplus	7.5+	n/a	n/a
Accuracy of Quick Test		40%	100%	100%	80%	n/a	n/a

Radishes—Easy to Grow, Fun to Eat!

Kathy Rucker



Radishes are one of the easiest vegetables to grow, making them perfect for children or anyone else who has issues with delayed gratification. The Greek name for the radish genus, *Raphanus*, means “quickly appearing.”

Radishes are a member of the Brassicaceae family, which also includes cab-

bage, broccoli and mustards. In ancient times, radishes were eaten as a vegetable, although oil from the seeds was used more often. The Greeks were very fond of radishes and offered them in golden dishes to the god Apollo. Radishes were introduced to England by the Romans and were a common food in English kitchen gardens in the 15th century. They reached the Americas in the 17th century, where they were used in radish sandwiches or in a sauce with meat to stimulate the appetite.

Consider using a “square foot” approach

to growing radishes. Plant 16 radish seeds per square foot and plant a square foot every other week as a succession planting for continuous harvest. Radishes are mature in about 3 weeks. They can be interplanted with slower to germinate seeds like beets and carrots. Radishes will grow in light shade. Lack of water and hot temperatures are guaranteed to produce radishes that are best used for the compost bin!

Six small radishes have only 2 calories, making them a great snacking option.

Radish and Cucumber Salsa

5 medium radishes, sliced
1 medium chopped cucumber
1/2 medium red/yellow pepper, chopped
3 green onions, chopped
1 T cilantro, chopped
2 T lime juice
1 t. olive oil
Combine all ingredients; season with salt and pepper

Baked Radish Chips

Radishes
Olive Oil
Garlic salt

Thinly slice radishes, toss with a small amount of olive oil, spread on cookie sheet, not overlapping slices. Sprinkle with garlic salt. Bake at 400°F for 5—10 minutes; flip chips and bake for another 5 - 10 minutes

Veggie Delights!

Marla Clark

When planning your next veggie garden, it's always good to know what worked and what didn't for someone else. I like to hear success stories that I can incorporate into my own planning strategy. So I'd like to highlight my two favorites, Johnny's (Seed Company) Provider Bush Bean, and Totally Tomatoes' Red Pear Tomato.

Johnny's Provider green bean, which has a nice slender, round pod with no need to "string" them before cooking, is one of the best I've ever grown. I got the organic seeds, and grew a bumper crop of green beans last year in spite of the cold start of summer. They are 50 days to maturity, although it did take a little longer for them to get going because of the cool weather, but when it warmed up, the plants really took off. I gleaned 3 to 4 pickings off each plant. This variety is easy to grow and adaptable to diverse soil and climate conditions. It will germinate well in cool soils and doesn't need to be trellised to hold them up.



Last year I bought a tomato plant listed as an heirloom, but it didn't have a tag to say what kind of tomato it was. It was started somewhere in Great Falls, and that was all the information I had. It turned out to be a red pear tomato, in the small to medium category of open pollinated types. It was absolutely the best tasting and sweetest of any "grape" type tomatoes I've ever eaten. But in searching through my catalogs I had a hard time finding the same one. But I finally found such a tomato in a catalog entitled Totally Tomatoes. It is listed as one of the rarest of the heirloom varieties, hardy with very few seeds, great for just munching on or in salads and sauces. It gives fruit all season long because it is an indeterminate type tomato. I really hope this is the same plant species as my mystery tomato. I'll report on this mid summer, so stay tuned!

Event Schedule

Know of an upcoming event related to gardening?

Let us know at [HelenaMasterGardeners@hotmail.com!](mailto:HelenaMasterGardeners@hotmail.com)

June 7, 14, 21

Rural Land Management Series

Tuesday evening from 6:00 - 8:30 pm at UM - Helena College
The cost is \$15 for the three classes. To register contact the Extension Office, 447-8346.

June 16, 2011

Growing Community Project—Free class

“Building Fertile Soil & Controlling Pests Without Chemicals”
6 - 8 pm
St. Paul’s Methodist Church

June 26, 2011

Helena Secret Garden Tour - to benefit the Original Governor's Mansion Restoration Fund
10 am - 4 pm
Tour tickets \$12.00 in advance - Leslie's Hallmark (both locations), Mountain West Bank, Montana Historical Society Museum Store
\$15.00 tour date (at Mansion only)
children 12 & under \$5.00

July 7, 2011

Master Gardener Family Picnic

6 pm
Lewis & Clark County Fairgrounds
447-8350 for more information

July 27-31, 2011

Lewis & Clark County Fair and PRCA Rodeo

July 27—31, 2011
Lewis & Clark County Fairgrounds

August and September 2011

Growing Community Project Food Preservation Workshops

8/18/2011—Waterbath Canning
8/25/2011—Pressure Canning
9/22/2011—Freezing, Drying and Fermenting
Contact Kendra Byrom at 406-495-0497 for



The Growing Zone Logo Challenge!

The Newsletter Committee would like to extend a call to artistic gardening enthusiasts to design an appropriate logo for *The Growing Zone*. Submit your design to HelenaMasterGardeners@hotmail.com or deliver it to the County Extension Office. Please submit your design as a .jpg file or on a document that can be scanned. The winner of the Logo Challenge will receive a 1-year subscription to the “Big Sky Small Acres” magazine.

Useful Links

MSU Extension Yard & Garden: <http://www.msuextension.org/category.cfm?Cid=5>

Missoula Plant Diagnostics Database: <http://www.co.missoula.mt.us/extension/plantdata/>

National Center for Appropriate Technology gardening publications: <http://www.attra.org/horticultural.html>

National Garden Association: <http://www.garden.org/>

Helena Garden Club: <http://helenagardenclub.wordpress.com/>

Lewis & Clark County Extension Office Web site: <http://www.co.lewis-clark.mt.us/index.php?id=75>

MSU Master Gardener Program: <http://gardenguide.montana.edu/mgardener/mgardenerindex.asp>

Growing Community Project: <http://helenagcp.wikidot.com/>

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