



GROUNDED

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Collect & Leave Leaves This Fall . . . *By Mark Amara*

The WSU Grant-Adams Master Gardeners received several clinic questions this fall concerning using leaves, including maple and cottonwood leaves, as mulch.

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As the days get shorter and the days and nights turn colder, leaves and needles are dropping everywhere out of the trees and shrubs around the area. Rather than sweeping or raking them up to put in the garbage, take to the dump, burn, or let blow away, consider using them as mulch. Leaves (or wood chips, yard waste like grass, brush, or clippings, or even crop residues) used as mulch (compost or cover) are an excellent way of reducing landfills, and leaves are actually a valuable annual renewable resource. I even have an arrangement to get unlimited piles of (untreated) shredded leaves from a neighbor, but more on that later.

Collecting and spreading leaves on or around the garden and yard can help to retain soil moisture and conserve water, minimize weeds, improve soil quality and health, reduce compaction, add nutrients to the soil, and even help promote plant growth. As cover, leaves (or other materials) that are spread on the surface are called mulch. Adding leaves also improves soil texture, stabilizes soil temperature, and reduces evaporation during dry spells.

Here we are in fall with mountains of leaves to deal with. Collecting leaves is sometimes a challenge, but there are many benefits to keeping and using them. Spreading leaf mulch helps smother weeds, reduces soil and water runoff, and increases water retention the following year. Using leaves in walkways or between plant rows is also an effective way to control weeds and add organic nutrients.

All plant mulches have some nutrient value in terms of nitrogen, phosphorus, potassium, calcium and magnesium and can provide 50-80% of the fertilizer that plants need each season. It is always best to soil-test at least every few years unless specific fertilizer needs are known. Adding biodegradable plant mulches stimulates microbial activity that, in turn, helps with rooting, decomposition, residue breakdown, which ultimately releases nutrients into the soil. As leaves break down, they also provide food for earthworms, which helps aerate the soil. Most leaves are a good source of potassium and often have a pH from 6-7.5. The potential for increased biological activity in the soil can help improve biodiversity and help prevent plant diseases.

Some mulch precautions to think about:

- Do not use leaves or other treated organic materials as the pesticide residues can affect subsequent plant growth.
- Avoid using leaves or other organic materials that have diseases or insect problems as these can spread to other parts of the yard or garden.
- Maple leaves can add as much as 2-3% nitrogen and don't seem to have any drawbacks.
- Like oak, cottonwood leaves are higher in tannins than most tree leaves, but adding small quantities of shredded cottonwood leaves mixed with other materials as mulch should not be a problem.
- Laying materials down 2-4 inches or more in thickness helps keep weeds from surfacing, assuming the ground is relatively weed-free to start with. If the layer is too thick, it will repel water, decompose more slowly, and can actually smother young desirable annuals.
- Always keep mulches several inches away from trunks of trees and shrubs and stems of herbaceous plants to help keep excessive moisture away from these interfaces (which can deter rots and other diseases).
- Remember that mulching does not control weeds indefinitely and materials must be reapplied for continuing benefits.
- Around perennial trees and shrubs, putting leaves higher and deeper, up to 3-6 inches, helps.
- Perennial weeds like field bindweed, horsetail, or quack grass are not controlled by mulching and will have to be pulled or dug up by hand or might even require some kind of chemical removal both before and after mulch is applied.

Adequately composting yard materials is a good way to reduce harmful impacts. Shredded leaves (or other materials) are more desirable than unshredded materials. Shredding helps with decomposition, and the increased surface area helps keep leaves in place (as they are less likely to blow away). If materials are not shredded, depending on how thick and compacted they get, they can form barriers that block water and oxygen movement in the soil. If there are only a few trees in the yard, consider shredding leaves and leaving them in place on the lawn using a mulching mower, which can be more effective than leaving the leaves in place as is.



This leaf catcher is pulled behind a lawn mower that picks up leaves and shreds them for easy removal.
Photo by Mark Amara

It is interesting as I lean on my rake for the umpteenth time this fall collecting and spreading leaves in my garden that I am adding a great soil-building product to my garden. Alternatively, my neighbor recently purchased a machine that he drives around his yard that picks up leaves and shreds them. I can have all that I can get from him at no charge.

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Plant Your Spring Garden NOW! . . . *By Terry Rice and Duane Pitts*

That's right! Now is the time to start planting your spring garden, especially if you like playing in the dirt!

We know. We know. It is fall and winter is coming: cold, snow, ice. But, yes, it is time to plant a spring garden. And it's okay to get your hands in the soil at this time of year. Let us explain.

Many seeds need at least 90 days of cold to germinate. Instead of using your refrigerator to cold stratify your seeds during fall and winter (we mean, do you really have the refrigerator room for stratifying?), plant those seeds outside. Here's how.

NEEDS: Use **November** to set up the planting containers. You will need the following:

- clear plastic jugs or translucent milk jugs without caps
- a sharp knife
- a permanent marker and plastic tags
- duct tape (any color you want)
- planting or potting soil

DECISION TIME: You have **TWO CHOICES** for sowing the seeds:

1. From **December to March**, you can sow seeds and add water to prepared jugs according to the **SOW TIME ONE** list (see list at the end of this article) of sowing at different times during this 4-month period.
2. OR you can sow all the seeds in **DECEMBER!** Check **SOW TIME TWO** (see list at the end of this article). Just remember to water occasionally during the winter. If you want to be done with one preparation, this is it and you still get your hands in the soil long before spring. What a bonus!

PREPARE planters you want for your garden. Set them aside until you are ready to sow the seeds.

- Make 4 slits at the bottom of the jug for drainage.
- Cut around the jug at least 4" from the bottom, but do NOT sever the handle. The handle will be the hinge to open and close the planter.
- Put 3" of soil in the jug. Soil with a time-release fertilizer is okay. Don't pack down the soil.



Photo by Duane Pitts

SOWING the seed is easy. The smaller the seed, the more you can sow in the jug.

- Water the soil so it is damp but not dripping wet.
- Scatter wildflower seed on top, add a thin soil layer, pat soil gently to stick to the seed. Plant 4-9 tree or shrub seeds equidistant apart in the jug. With flowering Japanese quince seed, sow 9 seeds in a tic-tac-toe pattern. If you sow linden seeds, 4 seeds placed equidistant apart will do.
- Write name of the plant seed on a plastic tag. Stick in soil, inside the jug, by the hinge/handle.
- Put 1 strip of duct tape (about 3-4" long) vertically over each seam on the 3 cut sides of the jug to keep the top half of the jug from flapping in the winter winds.
- Take off the cap for ventilation.



Photos by Terry Rice

SET the jugs in the garden. Let the rain blow, watch the snow drift down, let the sleet build up. Oh, and protect the jugs from the wind. You can place them in plastic boxes that have drainage slits in the bottom or place them between heaped rows of garden soil or between raised beds to keep winter winds from tipping them over.

SOW TIME ONE. If you choose to space out the sowing between December and March, set out the jugs of winter-sown seeds based on how many cold days the seeds need and count back from the last frost date for your area. In Moses Lake, that is between May 5-15. Err on the side of caution - use the latest date of last frost -- and, bingo, you have the date to set out the jugs.

- After December 21 (Winter Solstice), set out tree, shrub, and woody vine seeds.
- Starting in late January, set out the jugs of perennial and biennial seeds.
- In mid-February or early March, set out the jugs of cold-hardy vegetable seeds, hardy perennials and annuals.
- Early in March, set out jugs of frost-intolerant seeds: tender annuals, tomatoes, squash, gourds, beans.
- Check occasionally during the winter that the soil is moist, but not wet. Replace duct tape strips as needed.
- After the last frost date has passed, set out the seedlings with the rest of your garden plants. Clean and save the jugs for the next winter sowing.



Photo by Terry Rice

SOW TIME TWO. If you choose to set out all the seeds at one time in December, you get the delight of the preparation as well as the enjoyment of checking on the seeds during the winter when you venture forth to give the jugs a bit of water to keep the soil slightly damp - unless rain and snow have done that for you. Yes, leaving the cap off the milk jugs will allow sufficient moisture (rain or snow) to find its way into the jug to keep the soil damp.

After the last frost date, set out the seedlings and watch them grow and grow!

Consider the following seed choices through February: Allium family (onions, shallots, garlic, chives), brassica family, celery, chards, peas, radishes or spinach. Herb choices might include: anise, borage, chamomile, dill, mint, oregano, sage, thyme or tarragon.



Photo by Terry Rice

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Trees and Drought . . . *By Barbara Guillard*

Losing a tree that has grown for years at your home is a sad event. Over the past few years, our springs and summers in the Columbia Basin have been warmer and so have our winters.

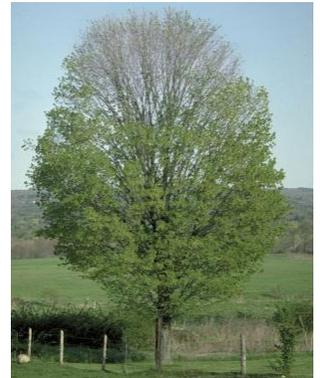
Knowing what to say to clients at our Master Gardener Clinics in the summer when they describe the symptoms of their dying trees causes a dilemma, because sometimes by the time they have noticed the symptoms of drought in the tree and look for help, the damage is too great, and the tree can't be saved. If that happens, it's time to refer them to a certified arborist.

The point of this article is to think about trees as valuable assets that are going to require care year-round from the time they are planted, perhaps even watering during the winter months, as the climate changes and the trees grow older. Researchers write that planting one tree to the west and one to the south of a house can significantly reduce energy use. An Environmental Protection Agency study states that annual cooling costs can be reduced by 8 to 18%.

Some trees do better in our dry climate than others. There are recommended pines, spruces, and maples and other species at your local nursery. If you choose to grow a tree not native to the environment, it is important to know what to do to keep it healthy and green for its long life, a life span that is greatly reduced by drought conditions. Gardeners should become aware of the gradual changes that occur to trees as they experience drier windier winters.

Drought conditions may vary from year to year. There can be short-term damage from one dry spell that will cause wilting, leaf scorch, and leaf loss, but if there is

too little moisture over a period of years, you will begin to see other signs of not enough water reaching the root system such as stunted growth, branch die-back, and death. Stem dieback occurs when the soil under the tree dries out in hot summer months and continues to be dry during the winter months. During drought, the tree first increases the number of fine feeder roots it grows as it searches for water, but if the drought period continues through the year, the fine roots die and are not able to take up water when it finally is available. The result may be that branches in the upper canopy of the tree die.



Long-term dieback in the upper branches.
Internet photo



This tree in Moses Lake was uprooted by the October 2013 storm. It was very drought-stressed, with dead top branches and very few supporting roots which may have been some of the reasons it blew over. Photo by Barbara Guiland.

The bad news for some homeowners is that many trees, especially evergreens, can take up to three years to show the symptoms of inadequate water. When a tree is weakened by drought, insects such as wood borers and bark beetles can invade it. The presence of these kinds of pests is a sign of a weak tree. Some pests, like aphids, spider mites, and lace bugs, which do not ordinarily harm a tree, begin to take away from the appearance of the tree as the tree loses its ability to grow new twigs and leaves faster than the insects can damage them. The tree's root system's ability to take up water is out of balance with the normal rate of growth of the tree's branches and leaves. Injuries do not heal well and other diseases like cankers can invade.

The practical thing to do is not to wait until there are signs of drought damage, but to anticipate tree needs. Some things to do when you live in a climate which is dry and where water for landscapes may be sporadically scarce are to choose plants that are known to do well in your area and to care for them in ways that will help them stay healthy during long hot summers and cold dry winters.

Incorporate organic matter into your soil. Weed regularly. Some healthy weeds are actually an indication of good soil, but you don't want them taking moisture away from your tree! Water deeply (as much as 12 inches for some trees) rather than frequently. Use soaker hoses or drip methods rather than watering overhead. Apply mulch properly around the base of your tree.

If you have lost a tree or if you simply want to add a new one to your property, many trees do well in our area. A few, however, become invasive, such as Tree of Heaven, Siberian Elm, and Russian Olive that you should not plant, but you will find tree lists on Eastern Washington Master Gardener websites or you can consider the following list of small trees or shrubs for Eastern Washington taken from the Washington State Noxious Weed Control Board website:

- Black Chokeberry, *Aronia melanocarpa*
- Smoke Bush, *Cotinus coggygia* & its cultivar 'Royal Purple'
- Eastern Redbud, *Cercis Canadensis*

- European Elderberry, *Sambucus nigra* & cultivars
- Western Serviceberry, *Amelanchier alnifolia*
- Apple Serviceberry, *Amelanchier x grandiflora* and cultivars
- Autumn Applause Ash, *Fraxinus americana* 'Autumn Applause'
- Smooth or Staghorn Sumac, *Rhus glabra* & *R. typhina* 'Lacinata'
- Raywood Ash, *Fraxinus angustifolia* 'Raywood'
- Blue Weeping Atlas Cedar, *Cedrus atlantica* 'Glauca Pendula'
- Double File Viburnum, *Viburnum plicatum* var. *tomentosum* 'Mariesii'
- Rose-of-Sharon, *Hibiscus syriacus*
- Weeping Katsura, *Ceridiphyllum japonicum* 'Morioka Weeping'

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Tilth Partners with Growers and Gardeners Large and Small

Tilth Alliance organization began in 2016 when Seattle Tilth, Tilth Producers, and Cascade Harvest Coalition merged. Their goals are to unite farmers, eaters, gardeners, cooks and environmental advocates to promote a sustainable food culture. The original organization began around 1977. Farm walks have been part of the offered programs for the last 14 years, with approximately 150 farmer-led walks held all over Washington State in partnership with Washington State University Extension. The walks are designed so individuals can share knowledge of farming practices in practical hands-on sessions.



WSU Extension, Doug Collins (left), Cloudview Farm owner, Jim Baird (middle), and Tilth Alliance rep
 Photo by Mark Amara

One local farm of note is at Cloudview on Frey Road northeast of Ephrata. Owner Jim Baird originally started Cloudview in Royal City in 2006 and added the Ephrata unit in 2012 with the desire to facilitate and inspire others to farm sustainably. Baird grew up in the Columbia Basin and has been farming for over 42 years in the area. While the Royal City farm is organic, the Ephrata property is farmed conventionally. It consists of 18 acres including irrigated row crops, greenhouses, windbreaks, and pasture adjacent to an organically farmed 80-acre center-pivot sprinkler irrigation system, 200 acres of pasture, 1000 acres in rangeland, and additional land in orchard and other land uses. Approximately 30-40 tours are held annually for elementary schools. The row crop part of the farm is moving toward an organic emphasis though it is still operated conventionally (using pesticides and inorganic fertilizers). Animals are an important resource that the farm is using to spread seed, control crop residues,

reduce tillage operations, add nutrients to the soil, and control weeds as part of the overall cover crop operation. Though that part of the farm's operation may not be as practical for home gardeners, all the other principles and practices utilized are.

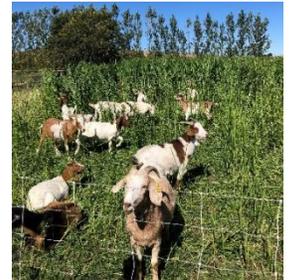
Cover Crops Ideal for Farm and Garden

The Ephrata Cloudview Farm was the location of a Tilth Alliance Farm Walk in late September 2018. Cover crops are being experimented with as ground cover to protect the ground from erosion, to add organic matter and nutrients, and to provide forage for livestock. Educational outreach is also a part of the farm,

helping students and the public learn about sustainable farming practices. The cover crop principles applied there are as applicable to home gardens as they are to larger farming operations.

Cover crops are used to control weeds and erosion, add organic matter, and help with soil building. When they are effective in reducing crop residues, animals save the farm money by reducing the number of times that tillage has to be used to prepare the ground for planting and can be sold as food. Incorporating animals has been a way to return nutrients in a different form while utilizing forage for livestock benefit.

Cover crops viewed included a triticale-vetch mix seeded at 150 lb per acre. A homogenous stand of sudan grass was planted at 50 lb/acre (being grazed by goats). Sudan grass is a warm-season grass that is planted after July 15 and is often used as a bio-fumigant prior to planting potatoes, onions or garlic. At first frost it releases prussic acid which kills nematodes and other soil-borne diseases.



Goats are used in this scenario to graze sudan grass cover.
Photo by Mark Amara

Additional cover crops were a grass (orchardgrass, rye, and tall fescue) - alfalfa harvested as hay until late in the season when it is left as pasture for sheep. Dark northern spring wheat was harvested and over-seeded (by airplane) with 8 lbs per acre turnips. After the turnips germinated, cattle were turned out to graze the reinvigorated wheat stubble and turnips. Finally, sudan grass-buckwheat cover crops were seen.



Grass-alfalfa cover crop - Photo by Mark Amara

All these examples illustrate the wide variety of cover crops that can be grown in the area. Cover crops are turned into the soil as green manure and add valuable organic matter and natural fertilizer to the soil.

Reference: Fall Cover Crops and the Value of On-Farm Education. Cloudview Farm. Ephrata Washington. September 24, 2018. <http://www.seattletilth.org/about/fall-cover-crops-and-the-value-of-on-farm-education>

Dahlias: *A simple flower with months of beauty . . .* By Marylou Krautscheid

Are you a gardener looking for something that will give you a lot of return for little effort? The dahlia is a plant that can provide that resource! From July until the first hard frost, the dahlia works hard to continue to produce beautiful showy blooms.

Dahlias can be obtained in a large array of bloom sizes, from tiny 2-inch pompons, to huge 16-inch giant dinner plate varieties. They also come in a wide span of colors, making it easy to find one that fits your gardens color scheme with your favorite bloom style.



Many researchers plan and grow huge gardens of dahlias. Every year, many new varieties are labeled, recorded and developed. While this method of gardening is very enjoyable, most home gardeners prefer to grow fewer plants for pleasure.

Maintaining dahlia bulbs through the winter can be a challenge. I used to dig mine in the fall and do nothing until spring, then wonder why some of the bulbs (usually my favorite) were dried up and gone. After some research, I learned that a little care in the fall can ensure bulb survival and increase the viability of my favorite varieties. According to ***Dahlias: A Monthly Guide***, from the Puget Sound Dahlia Association, there are a few steps to follow when digging up your bulbs:

1. Bulbs need to be dug up especially where the ground will likely freeze to the depth of the bulb.
2. Record on stakes the name or color of bulbs after digging.
3. After the first hard frost in the fall, cut plants back to six inches above ground and wait a week or so to dig them up. This gives the plants a chance to make the growth eyes more visible.
4. While digging, transfer the labels from the stakes to the bulb clump.
5. Dig around the plant before digging the whole clump; this helps reduce bulb breakage.
6. Using gentle water pressure from a hose, wash the clump thoroughly. Using too high of water pressure can damage the bulbs.
7. Trim off hair roots and damaged tubers and shorten any tubers over six inches long,
8. Soak tubers for about 15-20 minutes in a bleach solution (1/4 cup household bleach to three gallons of water). This helps reduce the chance of rot and mildew during storage. Once washed and soaked, allow tubers to dry on screen or newspaper for 12-24 hours.
9. Using a clean sharp cutting tool, divide up the clump of dahlias, discarding any tubers that don't appear healthy. Using an indelible pen, write on the tuber itself the name or other identification you choose.
10. Tubers store well in plastic bags with some type of storage medium, (wood shavings, vermiculite, sawdust or sand). Keep tubers in an area free of frost and at a constant temperature of about 40 degrees Fahrenheit (unheated basement, garage, or root cellar).
11. Check your bulbs periodically during the winter. Wet bulbs can lead to rot, so if you see this, open the bag for a couple days to help them air out. If bulbs are shriveling and appear too dry, add a few drops of water to the bag, being careful not to get them too wet.



All photos by Marylou Krautscheid

By March, there should be some new growth showing on the bulbs. Open the bags and check for anything that is not healthy and needs to be discarded. At this time, the planting sites should be prepared; soil turned with the addition of fertilizer and/or compost will ensure adequate plant nutrition. The planting site(s) need(s) at least 6-7 hours of direct sun daily.

In April, or after all danger of frost has passed, return tubers to the garden. Drive a support stake first, then dig a hole 4-6 inches deep and plant tubers with the "eye" close to (3-4 inches from) the stake. Add 2 inches of soil to allow the bulb to warm and grow faster, and finish filling the hole as the plant grows.

As the plant grows and starts blooming, tie it to the stake. This is especially important as it helps support any plants that have large blooms, which tend to tip over. Weekly removal of spent blooms ensures ongoing bloom production and enjoyment.

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No, Goats Do Not Eat Tin Cans! . . . By Duane Pitts

"What can goats NOT eat?"

This was one of the most interesting questions posed to the WSU Grant-Adams Master Gardeners at the Moses Lake Farmers Market Plant Clinic on August 25, 2018. My first, flippant remark: "Steel rods and granite!" Then I added, "We will look that up and get back to you. We just don't know what they do NOT eat."

Like most people, I thought goats ate everything! My maternal grandmother had a goat, Molly by name, and her pen was bare ground, so I assumed she ate everything there -- trees, weeds and all. My paternal grandmother had a goat which my Uncle Bud hitched to a cart and rode him around the house until the goat ducted under the raised house when Uncle Bud was not looking and knocked him out cold when he hit the sill! Smart goat!



Photo: Free, frog-background-he.blogspot.com

However, since August I have learned that goats do NOT eat everything, least of all tin cans, steel rods, or even granite! Though many plants are good for goats (and most goat farmers know this), some plants are toxic for goats. According to the Department of Animal Science at Cornell University, goats do NOT have a cast-iron stomach! Some goats accidentally sample toxic plants and suffer the consequences, but the major reason for food poisoning for goats comes as a result of having nothing else to eat when they ingest poisonous plants.

Sometimes goats will spit out a plant (like Foxglove) that tastes bad to them and not repeat that experience. When nothing else is available, they will sample paper, various weeds, clothes, and even plants they do not know are toxic.

The poisonous plants fall under the following categories: alkaloid, cyanogenics, photosensitizing, saponins, tannins, glucosides, volatile oils, and others in a mixed category. Those interested in determining which plants belong to these groups can Google the category name. For our purposes, I will list some of the common plants/fruits toxic to goats in our area.

Here's my short list of POISONOUS PLANTS TO AVOID:

- Avocado, Azalea, Black Locust, Boxwood, Buckwheat
- Buttercups, Cherry (Wild, Choke, or otherwise), Chocolate
- Clover, Cocklebur, Common Poppy, Daffodil
- Fiddleneck, Gladiolus, Kale, Larkspur, Lupine
- Any Nightshade variety, Holly trees or bushes
- Iris
- Ivy
- Laurel
- Lilac
- Lily of the Valley
- Marijuana
- Marsh Mallow
- Milkweed
- Mullein
- Oak (limbs, leaves, acorns)
- Pine Trees (do NOT feed goats living or dead Christmas trees!)
- Ponderosa Pine Needles
- Rape
- Red Maple
- Rhododendron (kills a goat very quickly - probably before the vet can be called)
- Sand Bur
- Sevenbark
- Rhubarb leaves
- Tomato plant
- Yew trees

This list of toxic plants is NOT exhaustive, of course, so always check before feeding a goat any plant. "Know BEFORE you feed a goat" is wise advice.

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Partners Unite At Soap Lake Demo Garden



Garden Club Vice President Sharon Davis confers with Grant-Adams Master Gardener, Glenn Martin.

The WSU Grant-Adams Master Gardeners and the Soap Lake Garden Club recently formed a unique partnership after it became apparent that the established Soap Lake Healing Waters demonstration garden might not be taken care of and could fall into disrepair. What was originally designed as a rose garden had expanded over the last several years to include a number of perennial flowers, shrubs, and grasses.

The garden lies on the edge of the Soap Lake city park just west of State Highway 17 where it is visible and where anyone can visit it. Having it well taken care of by the partnership is a way to give back to the community, keep color and diversity on display using good gardening practices, and keep several people active and working together. Seven individuals from the two Soap Lake groups met for the first time in October 2018 to prune, trim, clean out garbage, and dig out and/or pull up invasive species like cottonwood, mare’s tail and other annual weeds.

Those participating included Soap Lake Garden Club members Sharon Davis, Sheila Fowler, Eleanor Haner, Steve Madsen, and Steven Yakish. Those representing the Grant-Adams Master Gardeners included Glenn Martin, Tamara Wallace, and Mark Amara. The effort was successful and it was decided to make the work party a semi-annual event.

Other WSU Master Gardener-maintained demonstration gardens are located at the Old Hotel in Othello, at the public library in Moses Lake, and at the Community Garden in Ephrata.

To Grow a Linden Tree from Seed . . . *By Duane Pitts*

So, you want to grow a Linden tree from seed, do you? Well, you need Lady Luck and the patience of Job. It is possible to grow a Linden tree from seed but, like dandelions, not all the seeds will germinate.

First, usually in October, gather the browned seed pods before they turn dry and hard. Pods need to come from a 15- to 100-year-old Linden tree. Any younger tree will not produce enough viable seeds for you to



Group of seven dedicated individuals in various working positions from the Soap Lake Garden Club and WSU Grant-Adams Master Gardeners cleaned up the Healing Water demonstration Garden in late October
Photos by Mark Amara

mess with. Look for weevil holes in the outer husk even if the seed inside itself is untouched by the pests. Plant only those seeds from pods with no holes. And, you want disease-free seed.

Then, take a handful of seeds and toss them in a bucket of water. Scoop out and discard those that float; they will NOT grow. Those that sink are viable and can germinate. Now, prepare the seedbed for germination. Pick a spot that has access to water; a well-drained sandy loam soil with full sun exposure is ideal. Till the soil thoroughly. Do not add organic material or barnyard manure of any kind. If planting in a sandy loam, round it up in the center of the bed. If using sand, leave flat but do not pack it down.



Photo: Univ. California. Division of Agriculture and Natural Resources. <http://ipm.ucanr.edu/PMG/GARDEN/PLANTS/linden.html>

Protect the planted seeds with chicken wire around a wood-framed bed (4-foot wide by 12-foot long with 1x4 or 1x6 lumber). Planting 50-150 seeds per square foot might produce 50 seedlings in the whole bed in several years. Just because you sowed seed does not mean it will grow. Provide a mulch, like sawdust or straw which can be left on the seedbed. Anchoring hardware cloth over the bed will protect the seeds from rodents.

Linden seeds are notorious for taking 2 to 5 years to produce a seedling that you can transplant. Left alone in nature, about 1% of Linden seeds might, just might, germinate. This means you need Job’s patience - for a long time. You cannot rush it.

You can use an organic acid to digest the outer seed coating or scarify the coating, but only about 20 -30% of treated seed will germinate after cold stratification for 110-130 days. Untreated, fewer seeds will germinate. You decide if you want to force germination or let nature do its thing.

Once you sow and protect the seeds in October or November, walk away. Let the bed set for the next two or more winters, water as needed during the growing season to keep the soil damp but not sopping wet, and keep an eye out for fungus and rodents. You can peek all you want, but that won’t make the seeds germinate any faster.

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House Plants . . . By Diane Escure

Now that my summer flowers have faded and been deadheaded, geraniums and bulbs stored in my garage, gardening tools collected, cleaned and put away, my attention turns to the many house plants scattered throughout my house to provide bursts of green color, and, in the case of my Peace lily and orchid plants, occasionally provide some beautiful flowers. Besides these reasons though, I’ve learned that house plants have many other great advantages:

- **Improve Air Quality**—According to NASA’s studies on using plants to clean the air in space stations; many common foliage plants reduce some interior pollutants, including formaldehyde and carbon monoxide. Other studies have shown indoor plants (see list below) remove other indoor air pollutants, including ozone, toluene, and benzene. They can also raise relative humidity levels indoors, which is important during winter months when your heating system lowers humidity within the home. Another plus is the effect house plants have on dust. Studies have



Peace lily
Photo by Diane Escure

shown that plants can reduce dust in a room by as much as 20%. (Note: NASA researchers suggest that for plants to be effective "air cleaners," use one potted plant per 100 square feet of home or office space (Information courtesy of the Foliage for Clean Air Council, National Academy of Sciences and Colorado State University Extension).

Pollutant	Source	Plants that Remove Pollutants
Benzene	Inks, oils, paints, plastics, rubber, dyes, detergents, gasoline, pharmaceuticals, tobacco smoke, synthetic fibers	English Ivy, <i>Dracaena marginata</i> , Chrysanthemum, Gerbera Daisy, Peace lily
Formaldehyde	Foam insulation, plywood, pressed-wood products, grocery bags, waxed paper, fire retardants, adhesive binders in floor coverings, cigarette smoke, natural gas	Azalea, Philodendron, Spider plant, Golden Pothos, Bamboo palm, Corn plant, Chrysanthemum, Mother-in-law's tongue
Trichloroethylene	Primarily used in the metal degreasing and dry cleaning industries; also in printing inks, paints, lacquers, varnishes, adhesives	Gerbera Daisy, Chrysanthemum, Peace lily, <i>Dracaena marginata</i>

- **Stress Reduction**—One study showed that stress-reducing responses also occur when people are in a room with a few interior plants, even when their attention is not drawn to the plants (Lohr et al., 1996). Participants were asked to perform a computer task when no plants were in the room or when plants were present and positioned within the participant's peripheral vision. While performing the computer task without plants, participants' systolic blood pressure rose, indicating that the task was stressful. In the presence of plants, the rise was not as great, and it returned to pre-task levels more quickly than for those tested without plants. Other researchers have also documented that interior plants evoke stress-reducing effects that are similar to those evoked by nature.
- **Health Improvement**—Many studies have been conducted examining the effects of plants on people with specific health problems. For example, one study showed pain tolerance increased in the presence of interior plants among people who are not in acute pain. In a study in Norway, workers in an office with foliage plants reported fewer physical symptoms, including coughing, hoarse throat, and fatigue, than when no plants were present (Fjeld 2000). Another study of elderly residents in an assisted living facility who participated in a project to grow indoor plants in their rooms found that they reported significantly improved feelings of health after working with the plants (Collins and O'Callaghan 2008).

So, knowing that you might want house plants, how do you care for them?

Indoor plants need the appropriate amount of light and humidity, the right temperature range, soil conditions, nutrients, and watering. The table below (Source: Pleasant 2006) identifies some plants and the best places in your house to grow them for their different needs.

Plants needing bright light*	Plants needing medium light	Plants needing low light
-Grow best next to a large south or west-facing window	-Grow best near smaller east or west windows	-Grow best near north-facing windows or those shaded by trees, buildings.
<ul style="list-style-type: none"> • Aloe vera • Jade plant • Sago palm • African Milk bush • Croton • Ponytail palm • Areca palm • String of pearls 	<ul style="list-style-type: none"> • African Violet • Begonia • Bird's nest fern • Boston fern • Christmas cactus • Croton • Moon valley pilea • Moth orchid 	<ul style="list-style-type: none"> • Snake Plant • Staghorn Fern • Ivy • Pothos • Ferns • Dieffenbachia • Philodendron

*But not direct sunlight

Water and Humidity: Most houseplants go dormant in winter so without new growth, they don't need as much water as they do during the rest of the year. They suffer as much from overwatering as under-watering. Misunderstanding a plant's water needs is probably the number one cause of houseplant failure. Nearly all plants, whether indoor or outdoor, require good drainage. For potted plants, this means a container with a hole in the bottom for excess water to drain out. Plants must never ever sit in water. If water accumulates in the saucer after watering, be sure to pour it out. To check on when to water, put your finger about an inch down into the soil. If the soil feels damp, check again in a few days, but if it's dry, it's time to water. Make sure you water until a little runs out of the pot's drainage hole. During winter, create a more humid environment by grouping your plants together or by placing them on trays or saucers filled with pea gravel or pebbles. Pour water on the gravel but keep the plant pots above the water level.

Diet and Temperature: Since most plants are dormant in winter, don't fertilize until new growth begins in spring. When it is time to fertilize, use a balanced indoor plant food with an equal ratio of nitrogen (N), phosphorus (P), and potassium (K). Most houseplants grow well in daytime temperatures from 65° to 75°F and night time between 60° to 65°F. They don't like cold drafts, radiators, hot air vents, or touching cold windows.

If you're looking to buy new healthy houseplants for your home, be sure to check out those that will be sold by the Grant-Adams Master Gardeners at the indoor Farmer's Market, December 1st, at the CB Technical Skills Center, 900 Yonezawa Blvd, Moses Lake, 9- 2 pm.

For information on what can go wrong with your house plants, see Washington State University Extension's Bulletin CO64 at: <https://s3.wp.wsu.edu/uploads/sites/2076/2017/07/C064-What-Can-Go-Wrong-With-Houseplants-15a.pdf>

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Announcements

- **Moses Lake Farmers Market Holiday Market:** December 1, 2018, 9 am - 2 pm, at CB Technical Skills Bldg. (900 Yonezawa Blvd, Moses Lake) with WSU Grant-Adams Master Gardeners selling house plants
- **Poster and Logo Contest:** Grant County Conservation District and Grant-Adams Master Gardener Foundation are accepting submissions for a Logo and Poster contest. The logo design should promote the annual Eco-Gardening Symposium as it applies to urban and rural gardening. The Poster design should focus on at least one or more gardening solutions that apply to weed control, watering, cover crops, and soil management. Prizes for First, Second and Third places will be awarded and submissions are due December 17, 2018. For more information visit the GCCD website <http://www.columbiabasinncds.org/> for more details.
- **Fifth Annual Columbia Basin Eco-Gardening Symposium:** April 13, 2019, from 9-1 pm at CB Technical Skills Bldg. (900 E. Yonezawa Blvd.) in Moses Lake. The focus of this free seminar open to the public is on providing gardening solutions.

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