

Water Wise Gardening (“Xeriscaping”). Easy ways that you can use less water, pull fewer weeds while enjoying more growth from your plants. *This is a rather high-profile aspect of sustainable gardens and landscapes. The Nursery has water-retaining gels, moisture holding amendments, drip irrigation systems and loads of expertise.*

Landscaping Basics

A little basic knowledge of our region can go along way toward increasing your successes. The more we learn the more we see how much more we can understand. Understanding some ecology and the many natural interrelations between climate, topography, geology, exposure, altitude, soils, microbes, animals and much more is important to garden well.

Plants in our region must survive heavy Sierra snows (Sierra cement) and no Sierra snow (winter drought), rapid and extreme temperature swings (winter and summer), absent top-soil and acidic or basic base-rock (the reason our soils are acidic or basic), high-altitude sun and low humidity, to name a few. There are also many insects and diseases not to mention our troublesome and plentiful vertebrate neighbors including rabbits (*Lagomorpha*), beaver, gophers, porcupines, rats, squirrels, voles (*Rodentia*), moles (*Insectivora*), bear, raccoons (*Carnivora*), deer (*Artiodactyla*) and Birds (*Aves*). And then, of course, your landscape must be able to survive the ravages of snowplows and roof sheds.

Stroll around your neighborhood and take note of the plants in your local landscapes. Pay special attention to the landscapes of second-homes and of rental houses as their landscapes are often neglected and can offer excellent examples of extremely drought tolerant plants. Our native plants have obviously adapted well enough. Walk and hike often and observe learn the native plants and their habitats. This knowledge will help you tremendously with your gardening endeavors.

We understand that not everyone wants a native bitterbrush / sagebrush landscape so most of us need to water a little. It is an oasis, having a little patch of green in this great basin / high desert climate. Winters can be so long and a house gets to feel so small and a garden gives us extra rooms each summer.

Water is essential to all life and it is taken for granted. It is neither unlimited nor free. Many people pointlessly waste water and there are many easy ways in the house and in the garden to conserve a much larger percentage than we currently do.

Climate

In the northern Sierra Nevada we sit at the edge of two large climatic regions. On the western side, the Mediterranean type Pacific coast gives us almost all of our moisture in the winter and very few summer storms. On the eastern slope (Truckee) is the Sierra “rain shadow”, the semi-arid to arid Great Basin / high desert climate. By the time storm clouds pass east over the Sierra crest much of the water and warmth has been “squeezed” out of them.

Local climate variations occur within these broader regions. Latitude, altitude and proximity to lakes create variations. Local climate may depend upon direction of exposure, slope, location on a slope, ravines, ridge tops, vegetation, rock formations, streets, buildings, soil depth, soil type and many more great and minute features. As we define variations with greater specificity we eventually arrive at “microclimates”. Every town and every garden has microclimates. Microclimates may be as “micro” as the south facing wall next to your front door or as large as the entire south-shore of Donner Lake.

The growing season of a region is often equated with the frost-free period. According to NOAA, our frost-free period (>5% chance) is Mid-July – Mid-August. In the colder areas of Truckee there are full years with less than 10 frost-free days. At warm Donner Lake there may be years without any frosts through all of July and August. In most of Truckee a gardener should be prepared for frost or snow on any night of the summer (of course you expect it in the winter). Always have “floating row cover” (a commercial grade, spun fabric frost guard) ready to protect your tender plants from spring, summer and fall frosts. **Frost fabric can also be used as a shade cloth to prevent excess moisture loss on very hot days.**

In a broad sense, the gardening season may last from mid-March through late November when you consider the soil preparation, rockwork, weeding, feeding, raking, top-dressing and mulching that should to be done. We plant dormant trees, shrubs, perennials and hardy seeds in March if snow has melted and the soil has softened (thawed) and I have planted late-season, through December and into January with great success.

Plants aren't using much water when they are dormant but if they are alive, they need some. Every summer in our Mediterranean climate we have a drought and every winter it rains and snows. Some truly drought tolerant plants only pop up and bloom early, while the soil is still moist, then they die back to the root or go to seed and die-off as soon as summer drying begins. Some plants have very deep roots that follow silent water down as the surface moisture is sucked up and away by the dry air. Many other plants only survive in or near perennial streams and wet meadows.

We frequently hear: "Where are your natives, I want a landscape that I don't have to water" and "How long will I need to water this plant?". Not all native plants are drought tolerant and many non-native plants are extremely drought tolerant. The survival rates of native plants is very poor. Out of a million seeds produced by a plant only a few may actually grow into seedlings and out of those few surviving seedlings only a few, if any, will survive to maturity. In our own landscapes we do whatever we can to improve the odds of a plant's survival. Occasional summer irrigation of some kind (i.e. simulated thunderstorms) will always be helpful (particularly in July, August and September).

Large rocks, logs and building foundations shade the ground, keep more snow and hold reservoirs of soil moisture for thirsty plants into the summer. (See also MULCH.)

Soil

Soil is the "unconsolidated mineral and organic material on the immediate surface of Earth that serves as a natural medium for the growth of land plants". Our ground has very little or no organic matter and it is usually just some form or combination of rock. Were it not for the bacteria and essential fungi that associate with plants and actually digest the rock or gather nutrients and water, few native plants would live in the Sierra. The "top soil" which contains the organic matter, if any, breaks down quickly with freezing and drying and washes or blows away.

While some books and professionals, from climates and conditions far different than ours, discourage the use of amendments when planting trees and shrubs, we, in difference, find their use essential. The heavy, high-Sierra snow pack quickly re-compresses soils that have been merely turned. The use of some amendments prevent compaction, retain moisture and nutrients, provide aeration, promote soil biology and create a transition between the very coarse soils of most container grown plants to the finer textured native soils. As roots and microorganisms move across the various soil textures the archaic simile of a now pot in the soil is proven wrong.

Composted organic matter is the "miracle panacea" for all that ails of our mountain soils. Good compost supports plant life and maintains a balanced population of microbes, slowly digesting the soil and releasing essential nutrients to the plants. Organic matter holds the water and nutrients that would otherwise leach away in rocky soil and it helps loosen and aerate heavy silt or clay soils. Humus is the amorphous mineral goo that results from completely digested (mineralized) organic matter. Humus is essential for improving and maintaining soil structure. Humus glues fine particles into aggregates that create better aeration and drainage. It is immensely important to "top-dress" (spread fresh compost on top = mulch) a little every year in order to replace the organic matter that has been completely reduced, leached or blown away.

If you take the time to prepare a hole with ample mature compost, your plants will grow faster, require less watering, resist diseases, require less fertilizations, suffer less salt damage and generally thrive far better than a plant without the benefit of compost. "Put a two dollar tree in a ten dollar hole" don't put a ten dollar tree in a two dollar hole.

For additional drought tolerance we use water absorbing (and releasing) gel in our planting holes. These "synthetic sponges" hold up to 400 times their weight in water and release it back to plant roots as the roots demand it. The use of these poly-acrylamide gels can reduce the need to water by as much as 75%.

Fertilizer

Don't forget nutrients, a healthy plant will withstand drought better than a weak one. Always use naturally slow releasing organic fertilizers to promote vigorous sturdy growth, improve soil texture, structure and aeration, promote beneficial organisms and reduce the soil salt concentrations. Organic fertilizers will not pollute rivers, lakes or our groundwater. Using organic fertilizers with added soil microbes will help populate your soil with billions of beneficial microorganisms. Beneficial microorganisms in the soil work endlessly to digest dead roots, decaying bark, grass clippings, the mulch at the surface as well as other dead microorganisms. By this process they produce vast quantities of plant food.

Some soil fungi, mycorrhiza, do much more than others. Mycorrhiza are fungal associations between plant roots and species of fungi. The fungi may either surround roots or actually invade the roots while also spreading hundreds or thousands of feet out through the soil. The fungi take some carbohydrates and proteins from the plant. In return, the fungi give water and raw nutrients to the plant that the plant would otherwise never be able to acquire (remember that root to foliage ratio). The fungi and many of the other beneficial microorganisms help protect the plant roots from invading pests and pathogens. Pesticides, herbicides and many chemical fertilizers sterilize the soil, killing many of the beneficial organisms and effectively pruning the roots and destroying the natural sources of nutrients in the soil.

Most chemical fertilizers are highly soluble and wash through the soil very quickly. They may cause temporary excessive growth that requires excessive water. Many cause the destruction of healthy soil structure (and thus the moisture and nutrient holding capacity) which in turn means your plants need more water and fertilizer. The increased salt concentrations in the soil reduce the plants ability to take in water and in some cases, will cause the water to move out of the plant and into the soil (physiological drought). Water potential is the attraction of water.

Mulch

Mulch : from the Greek *molsch*, soft or soften. The best natural way to improve your soil and decrease watering by preserving moisture. ...like a moisturizer for the soil.

Our high elevation sun exposure, low humidity and frequent prevailing winds conspire to suck the water out of plants and out of the soil. As the shallow roots begin to dry, the plant stops taking in much of its water and nutrients and growth comes to a grinding halt. When you water again over the exposed soil, the plant begins to rev-up the metabolism and get ready to start drinking and eating. Meanwhile the sun is beating down, the dry winds are blowing and by the time the plant "wakes-up" enough to start drinking, much of the water is already gone. When your plants have a thick layer of mulch, the soil and roots are shaded from the sun's heat and protected from the drying winds. The roots are able to do their jobs all day, every day and the plants grow 3-4 times as fast. Our growing season is short enough, there is no point stunting the growth by skimping on mulch

Mulch also has the no less important effect of reducing or eliminating weeds around your plants, thus removing competition for water and nutrients. As the mulch slowly breaks down, the underlying soil is improved and nutrients are released. In areas of minimal snow, mulching before winter will protect the shallow roots from the ravages of freeze-thaw cycles that can severely damage even the hardiest plants. A fresh topping of a dark colored mulch will make all the plants in your garden appear vibrant green.

Mulch 2-3" of loose compost out past the drip-line of every tree, shrub or perennial in your garden. Mulching is essential, not optional. Imagine the hard working shallow roots of your plants just under the soil surface reaching far out from the plant. While we do everything possible to encourage the deeper roots, the majority of the nutrient and water uptake still occurs within a few inches of the soil surface.

When you plant, dig and amend your hole with compost, 2-3 times wider than the pot. Mulch 2-3 times wider than the hole. Do NOT mulch over the original root-ball, but from the edges outward. Mature composts amend IN the soil. Mulch may be composted or not and is used ONLY ON the soil.

Gromulch is our most nutrient rich mulch with the Gardener&Bloome Soil Building Compost a close second.

Lawn

A word or two about lawns: Keep them relatively small. Aerate lawns grown from seed every 3-4 years. Aerate sod lawns once or twice each year. Top-dress your lawn every spring with 1/8th inch of fine, mature compost (Kellogg's Topper or Amend after aerating). Fertilize with a bio-active organic fertilizer once or twice in the summer to inoculate the soil with fresh living microbes that will digest lawn clippings, improve soil structure and provide nutrients (Dr.Earth). Use a long-lasting organic fertilizer in the fall to provide for early lush lawns the following spring (Biosol). Mow 3-4" throughout the summer. Taller grass does not need to grow as much, requires less fertilizer, holds more moisture in the soil by shading the ground and suppresses weeds by blocking their sun. Use a mulching mower; add lime to bluegrass and clover and avoid using "weed&feed" or "plus" herbicide-type chemical fertilizers.

An argument for a small lawn:

Cool Season Turfs...

- *Can use less water than many xeriscape plants.
- *Are very traffic tolerant.
- *Can survive heat stress.
- *Produce more oxygen than trees, shrubs and flowers.
- *Remove dust and dirt from the air.
- *Act as a natural filter, it reduces pollutions by purifying water passing through the root zone. *And...*
- *Eight front lawns have the cooling effect of a 70 ton air conditioner.
- *2500 sq. ft. of turf grass releases enough oxygen for a family of 4, every day.
- *On a hot day, turf areas will be 15-30 degrees cooler than decks, patios, shrub beds and walkways.
- *Bluegrass, when placed on properly prepared soil and irrigated correctly and fertilized organically, can be one of the most xeric plants in your landscape. No other single plant can provide as many environmental benefits and increase property values as dramatically. *On the other hand...*
- *According to US Water Resources Council, lawn watering, swimming pools and automobile washing activities combined account for 27.5% of household total water usage.

Watering

"Low and Slow" - Watering is essential but should be done wisely. Automatic irrigation systems allow the most efficient use of water. We tend to under and then way, over-water when dragging hoses around the garden. Automatic systems let you fine tune watering for specific areas of your garden that may need more or less. Drip irrigation is the most water conservative method of irrigation. With drip irrigation we use the lowest volume emitters for the longest periods of time with the greatest infrequency. Low volumes of water over a long period of time gets the water deep into the soil where it is less apt to evaporate and where it will encourage the plants' deeper roots. As long as your plants are well mulched, infrequent watering will encourage deeper roots while slowing the surface roots. Overhead watering allows for much of the water to evaporate or blow away. Watering is best done early in the morning before the heat of the day to reduce loss from evaporation.

The larger a plant's root system, the greater it's resources and reserves are. Encourage wider root systems by placing drippers just outside the original pot's size and then later, just at the drip-line of the plant (below the outermost branches). Be sure to mulch well past the drip-line.

Natives

Dispelling a myth: "Natives don't need water". All life needs water. Some native plants are drought tolerant, others like alder, willow and dogwood won't live a week without water. Even very drought tolerant native species need water for the first few seasons in order to survive. Lilac and apple are two of the most drought tolerant species that thrive, neither one is native. "Established" - is a term.....

The survival rate of native plants is very poor. Out of millions seeds produced by a plant only a few may actually grow into seedlings. Natural seedlings develop a root system many times larger than their foliage area. This high root to low foliage ratio is essential to survival. Even so, out of the surviving seedlings only a few, if any survive to maturity.

Did we mention MULCH?

What you can do in the garden? Garden organically (because it is cheaper, easier and better for all of us), take care of your soil and MULCH. If you still don't know what we're talking about, listen well. **Never allow bare soil in your garden**, it breaks down, it washes away and it blows away. Mulch is insulation, a source of nutrients and a salve for your soil. You can use rocks, or gravel as mulch, if you like that sort of landscape. We prefer organic mulches, composted wood chips, bark mulch, cocoa mulch, Gromulch, compost. Organic mulch goes on top of the soil. It should be loose and full of air spaces for better gas exchange with the roots and to better insulate the soil surface from heat, drying winds and frost.

Most plant roots are near the soil surface. If the roots become dry, the plant stops getting water and nutrients and growth halts. When the soil is wet again the massive chemical metabolic machine slowly starts working again. With mulch, the soil never completely dries and the growth never halts.

Resources

Great sources of information include our surrounding forests and meadows and the people too. Visit the Villager Nursery, visit with your neighbors who have yards which you admire; most gardeners love to talk about their gardens. Go to the Library, look up gardening, landscaping, soils, composting, wildflowers, nature, and more. Hike often and look for habitats in the wild that remind you of places in your yard and take pictures.

Plants

Select plants that are appropriate; "The right plant in the right location" as any competent landscaper will tell you. Plants with large stomatas (the holes in the leaves that plants breath through) are not so great in the hot sun. Plants with gray or silver foliage are often more drought tolerant. Succulents are adapted to droutht, Spring bulbs like Daffodil and Tulip (and Autumn Crocus) are drought avoiders. They grow, bloom and use the sun's energy while the soil is moist, then lie dormant in the heat and drought of summer.

Trees and Shrubs (just a few)

Trees

Amur Maple
Apple
Chokecherry
Crabapple
Cypress
Juniper

Currant
Elderberry
Gooseberry
Juniper
Lilac
Manzanita
Oregon Grape
Mugo Pine
Potentilla (when well established)
Rabbitbrush
Rockspray
Woods Rose
Sagebrush
Snowberry: Rotund, Alba, Mollis
Spirae: W. White, Mt. Pink, Douglas', Pyramidata

Shrubs

Perennials

X = Thrives in slightly dry conditions, **XX** = dry conditions, **XXX** = very dry conditions

X - Rated	XX - Rated	XXX - Rated
Bellflower	Aster	Allium (bulb)
Bugleweed - Ajuga	Balloon Flower	Blanket Flower
Candytuft	Basket of Gold	Blue Fescue
Columbine	Bearded Iris	Blue Flax
Dead Nettle	Black-eyed Susan	Butterfly Weed
Delphinium	Catmint	California Fuchsia
Edelweiss	Cinquefoil	Cushion Spurge
Fireweed	Creeping Phlox	Daffodil (bulb)
Foxglove	Creeping Thyme	Evening Primrose
Gayfeather	Day Lily	Fringed Sage/Silver Mound
Hard Fescue	English Lavender	Globe Thistle
Hardy Geranium	False Indigo	Hardy Perennial Sage
Lady's Mantle	False Sunflower	Hens & Chicks
Lungwort	Geum	Hop
Maltese Cross	Globe Thistle	Iceplant
Painted Daisy	Goldenrod	Jupiter's Beard
Periwinkle / Vinca	Hardy Baby's Breath	Mount Atlas Daisy
Plantain Lily	Hardy Bachelor Button	Oriental Poppy
Purple Cone Flower	Hardy Ice Plant	Partridge Feather
Rudbeckia	Hardy Salvia	Penstemon
Self Heal	Hollyhock	Perennial Sweetpea
Shasta Daisy	Jacob's Ladder	Prairie Cone Flower
Sweet Woodruff	Lamb's Ear	Pussytoes
Tickseed	Lavender Cotton	Silver Mound
Verbena	Leadwort	Soapwort
Windflower	Mountain of Gold	Statice - Sea Lavender
Yellow Archangel	Oregano - Marjoram	Sulfur Buckwheat
	Pasque Flower	Sun drops
	Peony	Wooly Thyme
	Pincushion Flower	Yucca
	Pinks - Dianthus	
	Poppy	
	Red Hot Poker	
	Rock Cress	
	Rose Champion	
	Russian Sage	
	Sandwort	
	Sea Holly	
	Sedum - Stonecrop	
	Sun Rose	
	Veronica	
	Yarrow	