WaterWiseTips.org
IRRIGATION GUIDE

CITY OF BEND

Your Guide to WaterWise Landscaping in Bend

LANDSCAPE

INTRODUCTION

The WaterWise Transformation Starts Here

Nestled at the eastern base of the Cascade Mountains in Central Oregon, Bend is surrounded by a beautiful high desert environment. You don't have to go far to hike Tumalo Falls, mountain bike down a tree studded forest trail, or raft down the Deschutes River. In fact, the abundant outdoor recreation opportunities and diverse natural environments are some of the primary reasons people choose to call Bend home.

What a beautiful place to live!

Local landscapes of trees, shrubs, lawn and perennials often provide some of the same benefits of these other, more natural areas in and around Bend. These areas also provide a breath of fresh air, a space to recreate, and a place to gather with family and friends. And they, too, are dependent upon our most precious natural resource – water.

Water is essential to life. In Central Oregon it arrives as precipitation in the form of rain or mountain snow and makes its way through porous, volcanic earth and into the Deschutes Regional Aquifer. Only occasionally throughout this journey does water reveal itself as a natural spring, creek or river. Ultimately, it is our responsibility to be stewards of this water, regardless of whether you're camping along the shores of a Cascadian lake or preparing to transform your home's landscape into something new or more water conscious.

The Bend WaterWise Landscape Guide was created for this purpose – to help Bend landscape owners understand and implement the keys to a WaterWise landscape. Proper planning, appropriately amending soils, considering the role of stormwater, and understanding irrigation system operation and maintenance are all part of a WaterWise landscape. But water isn't all you save! A WaterWise landscape can also reduce the amount of time you spend mowing, fertilizing, pruning and weeding, not to mention reducing green waste and energy use. Perhaps best of all, a WaterWise Landscape can free you up to explore more of what Central Oregon has to offer.

Transform your home's yard into a WaterWise Landscape!

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Utilize Low Water Plants

PLAN & DESIGN

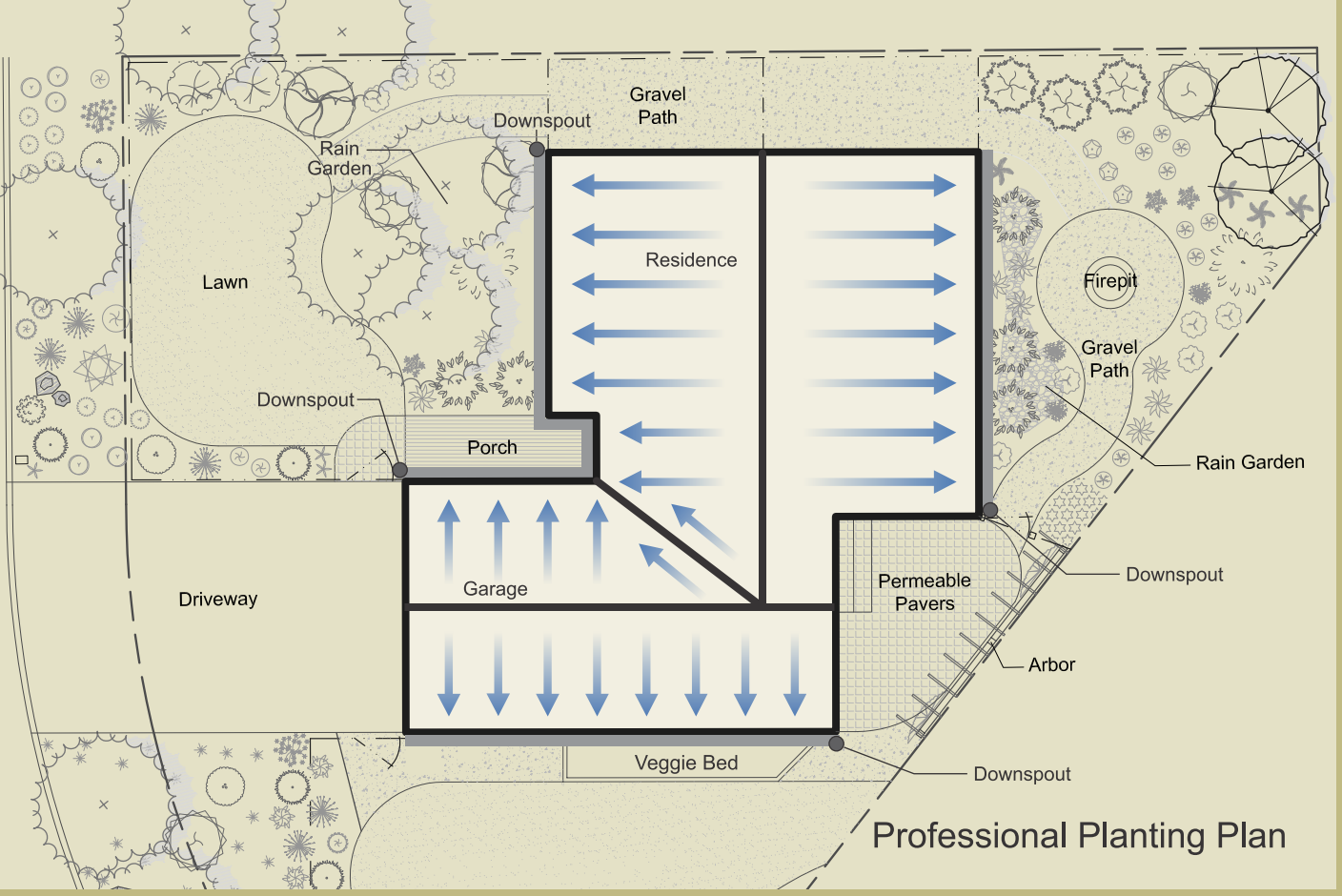
Planning for the Future

A Bend WaterWise landscape begins with a well thought out plan. Plans can almost always be tailored to meet your needs and budget. While budgets can sometimes limit the scope of a landscape transformation, a good plan will allow the project to be phased in over years, while still yielding wonderful results.

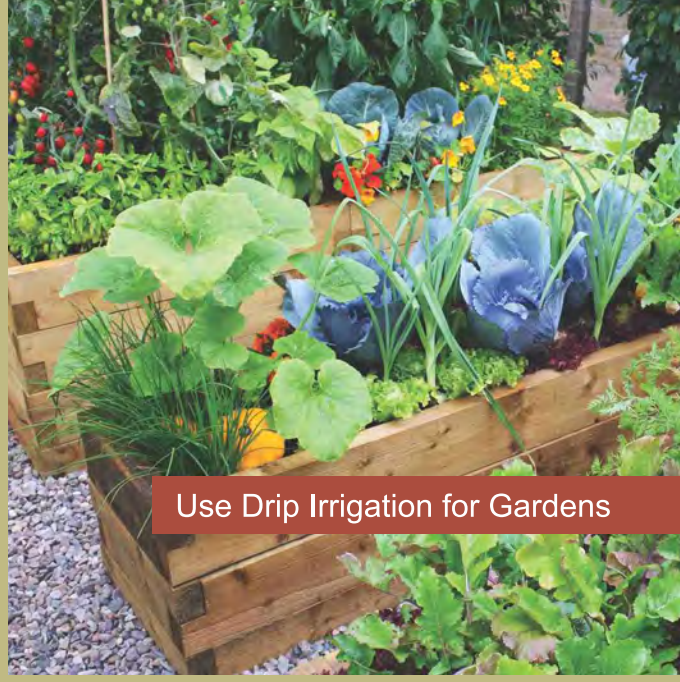
Think long-term. Consider functional uses for the landscape, like outside entertainment, storage, play and gardening. The property also needs to be evaluated for slope, sun exposure, wind, views (desirable and undesirable) and drainage to determine areas that are suitable for the intended landscape. Keep in mind that rain runoff must be kept on site per state and local rules. Working with the natural drainage on your site and choosing permeable materials can reduce potential drainage issues and project costs when considered early in the project. Determine where berms and contours in the landscaping may help retain rainwater and direct it to plants, potentially reducing your irrigation needs.

If possible, spend some time observing your property to better understand and appreciate the site's specific attributes and constraints. While you are getting to know your property, think about your lifestyle and how much time you want to spend maintaining your landscape. This is also the time to see if there are any neighborhood or homeowner association landscape requirements that need to be followed.

Consider hiring a professional landscape designer. It may be a wise investment in creating a scaled plan that you or your landscape contractor can work from to make the vision a reality. Professional landscape designers often have a good understanding of what plants work best in our unique environment, where to source materials and what local ordinances the landscape may need to adhere to.



Professional Planting Plan



Use Drip Irrigation for Gardens

Use Efficient Sprinklers

TRANSFORMATION TIPS
PLAN & DESIGN CONSIDERATIONS

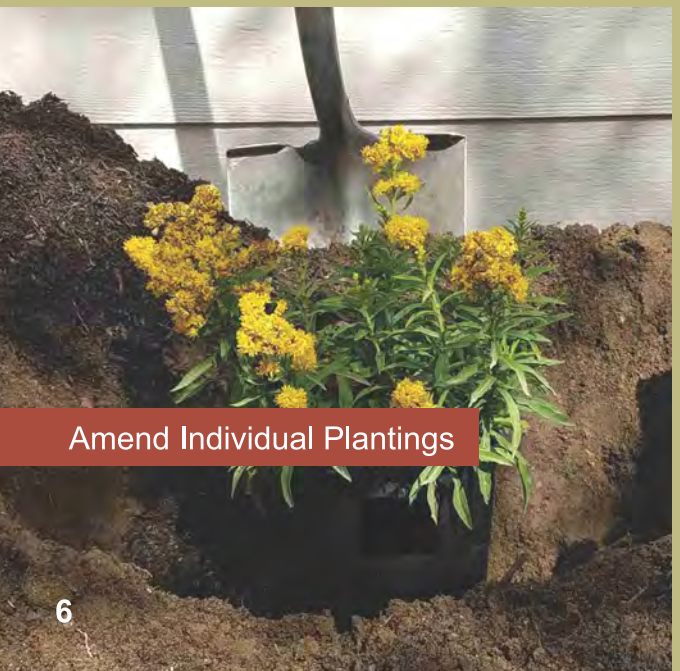
- Think about your overall landscape needs and how you will use your landscape
- Consider how much water your landscape will require
- Evaluate the site for drainage, sun exposure and other site specific conditions
- Visit waterwisetips.org for tips on how to choose a contractor

Plan for Seasonal Color

Typical Soil in Bend

Amended Soil

SOIL



Amend Individual Plantings

Soil Probe Test

Soil – A Landscape's Fuel Tank

Soil is a critical component when it comes to the success of a thriving, healthy Bend WaterWise landscape. Most of us take for granted that soil is actually a living and dynamic ecosystem. It holds water and nutrients plants need to flourish. Your soil composition will dictate how often you need to water, as well as how much supplemental nutrients/fertilizers you need to apply to your landscape. Central Oregon soil is primarily comprised of volcanic ash, pumice dust, and very little or no organic material. Our native soils in Bend have a pH of 7.0 or higher.

Think of the soil as the "fuel tank" for your landscape. You can increase the size of the "fuel tank" if you amend the soil with organic material, such as compost, aged manure or mulch. The organic material needs to be thoroughly mixed into the native soil either manually or mechanically with a rototiller. It is highly recommended to amend your soil with organic matter prior to planting both lawns and ornamentals. However, if you're transforming an existing landscape, amending the soil can be accomplished in stages and over a period of time. The best way to incorporate organic material into an existing lawn is to spread a 1/4" to 1/2" layer of compost over the lawn after a thorough aeration. This is often done at the end of a growing season so that the aeration cores and compost have the winter to breakdown and make their way back into the soil.

The application of organic material will not only increase your soil's holding capacity for water and nutrients "fuel tank"; it will start to build a community of soil microbes that are an essential part of soil functions. Soil microbes break down vital nutrients and convert them to forms that are suitable for plant roots to absorb; this can lessen the amount of fertilizer needed in the landscape. The lifespan and overall performance of landscape plants can struggle without these important microbes and available nutrients.

Plants native to Central Oregon are generally happy with our native soils and prefer them to be unaltered. However, native soils disturbed through construction or other activities may have had their ecosystem disturbed to a point where they also need attention. Getting a soil test done and checking for overly compacted soils may help in these situations.

TRANSFORMATION TIPS
FILLING THE SOIL FUEL TANK

- Native plantings rarely require soil amendments and prefer to be undisturbed
- Lawn areas need about 3” of soil amendment tilled to depth of 6” or more
- Existing lawns can benefit from a regular topdress layer of 1/4” to 1/2” soil amendment after a late season aeration
- Amend landscape plants with soil amendment equal to 1/3 the size of the planting hole

Rototill Soil Amendents with Native Soil

Spread Soil Amendments Evenly in Planting Area

Aerate Small Areas with a Pitch Fork

Core Aerator with Hollow Tines

Stormwater Swale Collecting Rain

STORMWATER

Managing Stormwater is Everyone's Responsibility

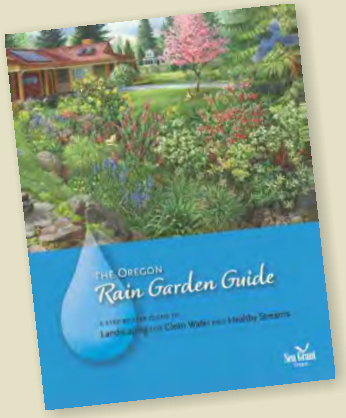
Bend's annual precipitation is approximately 12" per year – most of which falls November through February, and often as snow. Brief thunderstorms provide a small amount of moisture in the warmer months, but it usually isn't enough to sustain a non-native landscape on its own. Rain, snow, or any other form of precipitation that collects and runs off a property, is considered to be stormwater.

Managing our stormwater is not only the right thing to do in a Bend WaterWise landscape, it is also required by federal, state, county and city laws. This helps prevent localized flooding and protects our surface and ground water sources. When stormwater runs across impervious surfaces (streets, sidewalks, roofs, patios, etc.) it picks up contaminants and sediment that can pollute our rivers and groundwater, and pose serious issues for fish and wildlife habitat. The keys to preventing this pollution are collecting stormwater before it runs off the landscape, letting it filter naturally through on-site swales, and ultimately absorption into the soil.

Rain gardens are a great way collect stormwater in a landscape. Not only are you capturing stormwater and letting it filter naturally into the soil, you are also creating a micro-climate within your landscape that can be host to different types, colors and textures of plants. Most, if not all, of these plants need to be able to withstand frequent dry spells and periodic inundation of water. Plants suitable for rain garden use in Central Oregon can be found in the OSU WaterWise Gardening Guide or through **waterwisetips.org**.

How Much Water Do You Need to Be Able to Maintain?

The amount of stormwater that needs to be retained will depend on the amount of impervious surface you have. Impervious surfaces like roofs, sidewalks and driveways don't allow water to soak through and create runoff. Multiply the total square footage of impervious surfaces by 0.2' (the quantity of water we receive during a 25-year storm). This is the approximate quantity of water you need to be able to retain on-site.



Oregon Rain Garden Guide

One of the best ways to retain stormwater is through a rain garden. Visit **waterwisetips.org** to download your free copy of *The Oregon Rain Garden Guide: A Step By Step Guide to Landscaping for Clean Water and Healthy Streams*.

Shady Rain Garden in Wet Season

Permeable Pavers/Dry Stream Beds

TRANSFORMATION TIPS
STORMWATER MANAGEMENT

- Work with the natural topography of your site
- Reduce the amount of impervious surfaces, if possible
- Calculate the quantity of water you need to retain
- Ensure all stormwater is retained on site
- Use landscape plants recommended for rain gardens

Full Sun Dry Stream Bed

Stormwater Swale and Dry Creek

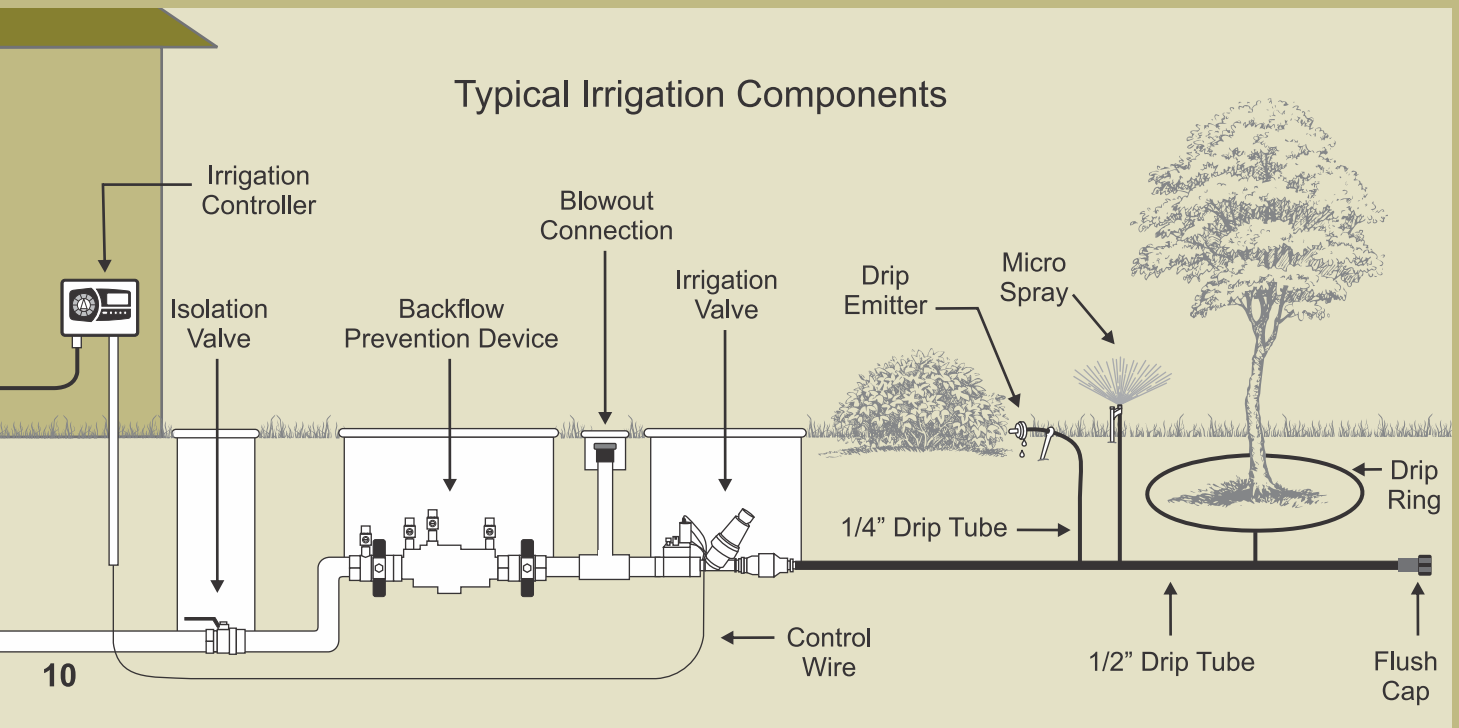
TRANSFORMATION TIPS
SLOWING THE FLOW

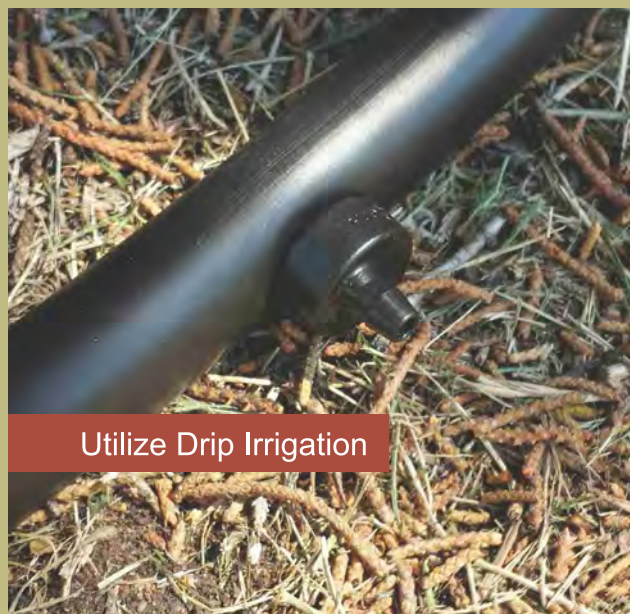
- Utilize drip, micro sprays and matching high efficiency sprinkler nozzles
- Upgrade to an EPA WaterSense labeled smart irrigation controller
- Install pressure-regulating sprinkler bodies if pressure is above 50 psi
- Make regular schedule adjustments as temperatures change
- Conduct regular inspections to identitfy leaks, runoff and overspray

Make Regular Inspections

Even Distribution is Key

EFFICIENT IRRIGATION





Utilize Drip Irrigation

Using Water Wisely in the Landscape

Most people underestimate the amount of water they use in the landscape. It can be difficult to know when a majority of the system resides underground, schedules are programmed to run at night, and our porous soils quickly soak up leaks. On average, 60 percent of the annual water use of residential homes in Bend is used for irrigation. That's a lot of water. It can be even more if the irrigation system is poorly designed, installed or maintained.

Bend WaterWise landscapes can use considerably less water than the average landscape. That's partly because they utilize the most efficient irrigation components and incorporate routine system inspections. An EPA WaterSense labeled smart irrigation controller adjusts irrigation run times based on environmental conditions. Be advised – a smart irrigation controller alone will not repair a leaking, poorly designed or poorly maintained irrigation system, and will highlight the inefficiencies in your system. When combined with a good management plan, however, it will provide a greater level of control over your irrigation schedule, which can save a lot of water.

In a water efficient landscape, trees and large shrubs are irrigated through a drip irrigation system, planting beds and gardens use micro sprays, and lawn areas are irrigated through pressure-regulating sprinklers equipped with high efficiency nozzles. Trees, shrubs, lawn and perennials are all irrigated through separate irrigation zones, as their water requirements are different and will require different runtimes. Seasonal irrigation schedule adjustments should be made regularly to apply water as it is needed by the plant material.

Irrigation runoff and overspray are two particularly common issues that should not be overlooked, as they are a violations of Bend Code (14.20) and waste more than water. They also impact our local stormwater quality, street maintenance and pedestrian traffic.

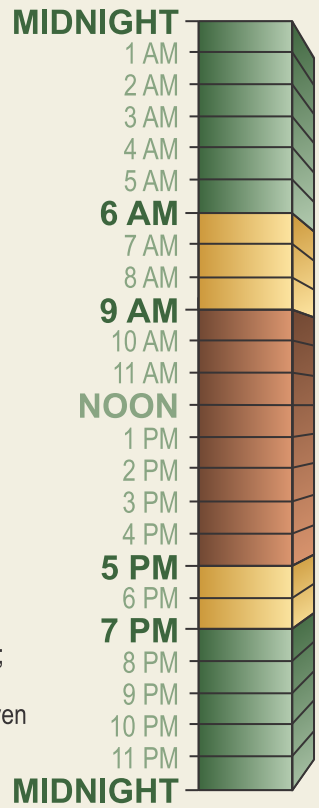
IRRIGATION RULES & HOURS

- No irrigation between 9:00 a.m. and 5 p.m.
- No irrigation water running off your property onto other sidewalks, streets or neighboring properties.
- No overspray of irrigation onto impervious surfaces.

Best time to irrigate; low system demand

Avoid irrigation if possible; high system demand

High system demand; hot, windy, high evap rate; rule variance given for new sod, seed, plantings

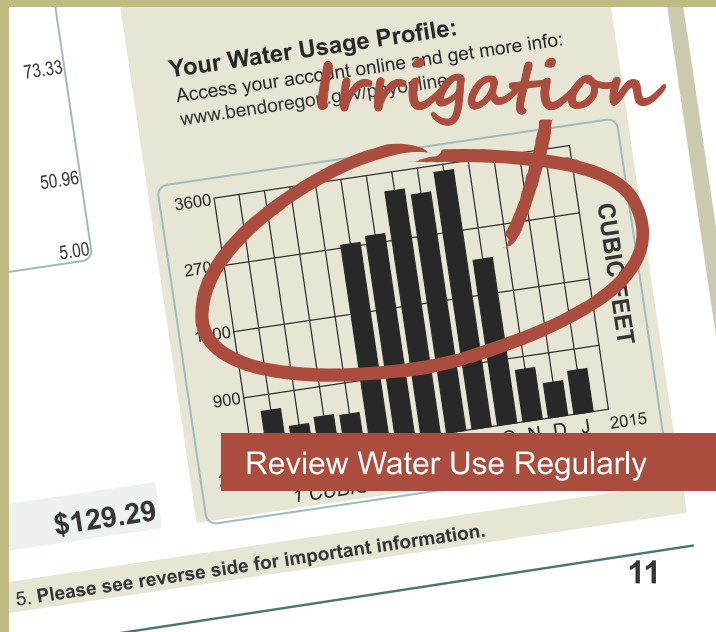


4 STEPS TO EFFICIENT LAWN IRRIGATION

Follow these four steps to increase your lawn water efficiency using an irrigation gauge.

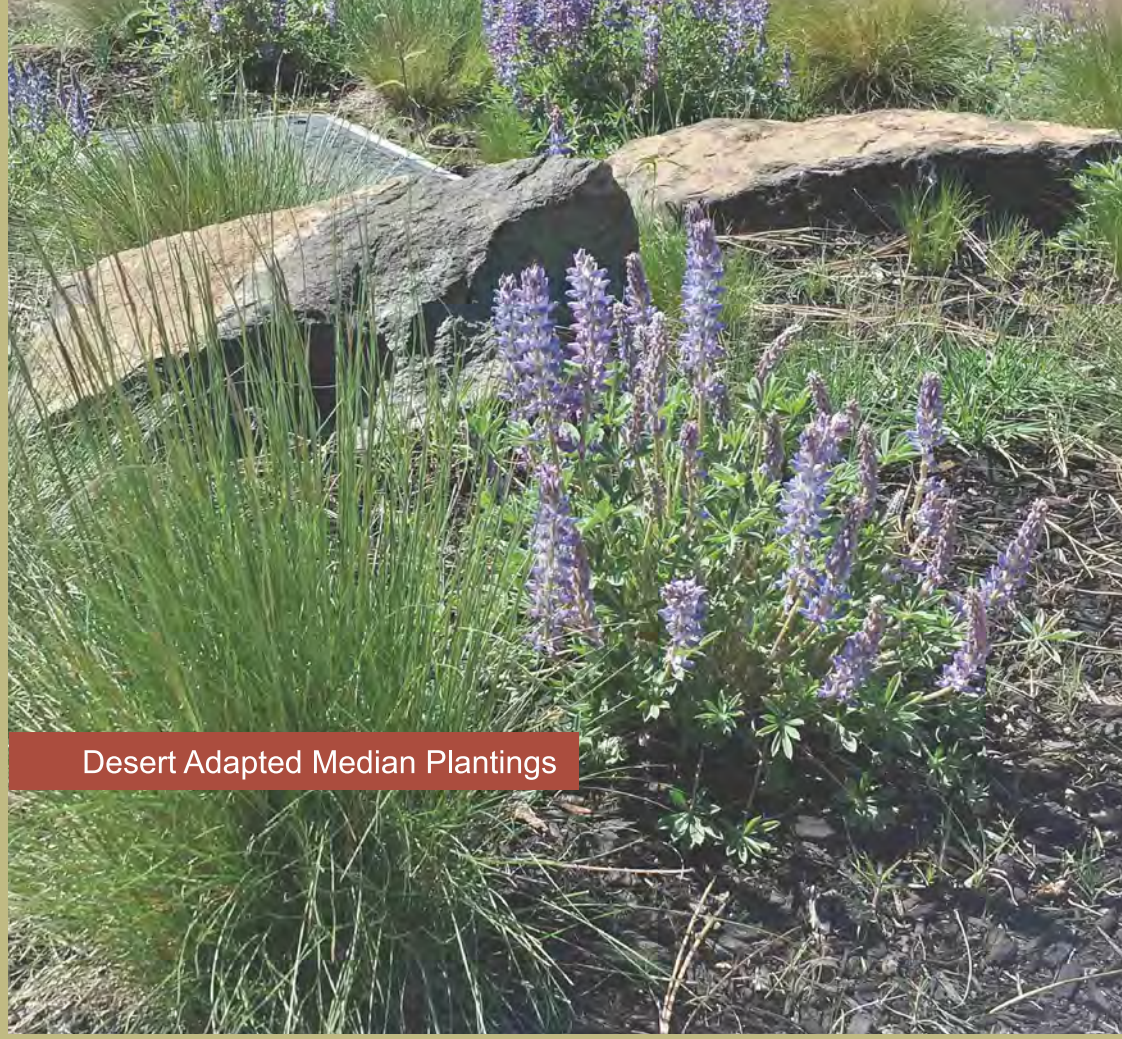
1. Place irrigation gauge in an irrigated area making sure that it is at least 24" away from the closest sprinkler.
2. Run sprinklers for exactly 10 minutes.
3. Measure the water in the irrigation gauge.
4. Program irrigation controller to deliver the approximate weekly water quantity in the chart provided to the right.

WEEKLY WATER NEEDS	
APR	0.75" / week
MAY	1.00" / week
JUN	1.25" / week
JUL	1.50" / week
AUG	1.25" / week
SEP	1.00" / week



Fescue and Clover Provide a Green Look

LAWN & ALTERNATIVES



Desert Adapted Median Plantings

Mass Planting of Blue Fescue Grasses

TRANSFORMATION TIPS
RETHINKING THE STANDARD

- Size lawn areas for the intended use
- Consider alternatives like grasses, perennials and other low water options
- Amend the soil as appropriate for the plant choice
- Ensure lawns are irrigated evenly and efficiently

Low Maintenance Streetscape

Making Green Easy & Functional

Bend lawns require a great deal of water, soil amendments, fertilization and maintenance to be healthy. That doesn't mean that they should be left out of the landscape plan or design. It does, however, mean that you should think about how large they really need to be, how often they need to be tended to, and how much more water they require than a potential lawn alternative. These functional areas of lawn are often incorporated into a Bend WaterWise landscape to accommodate specific uses such as entertaining, recreation and active pets.

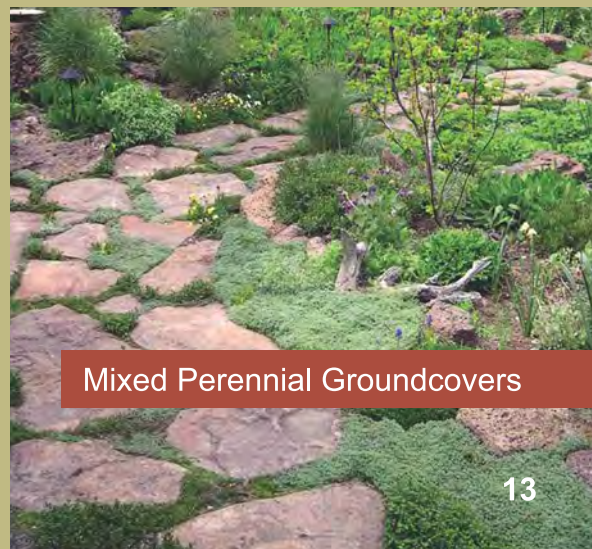
Avoid installing lawns on steep slopes, in shady areas, in small or highly fragmented areas (like narrow strips), along hard surfaces (like sidewalks or curbs), and in high traffic routes. It is virtually impossible to irrigate some of these areas without having water over spraying or running off onto nearby sidewalks and streets. Avoid planting trees or other plants in a lawn or lawn alternative area, as their water needs are different.

Some Bend WaterWise landscape owners are opting out of a traditional lawn installation in favor of a lawn alternative that provides a similar function or look. Low growing or creeping perennials, native grasses and eco-lawn type seed mixes are gaining in popularity. Each of these offers different and specific benefits, but they all reduce the amount of irrigation, mowing, fertilizer and general maintenance required of traditional lawn areas.

Regardless of whether or not a lawn area becomes part of your Bend WaterWise landscape, know that what's in the underlying soil is what really matters. A properly amended soil will help act as that "fuel tank" and provide those much needed nutrients. It will also increase the water holding capacity of the soil in and around the plant root zone.

Traditional Lawn

Flowering Eco-Lawn



Mixed Perennial Groundcovers

Fall Foliage

PLANT SELECTION

Winter Interest

Green Choices for the High Desert

There are many native and acclimated plant species that will thrive in a Bend WaterWise landscape. These plants vary greatly in form, texture, color and fragrance, and can provide interest and beauty throughout the year. These native and high desert adapted plants will withstand drought, wildlife damage and are more water efficient .

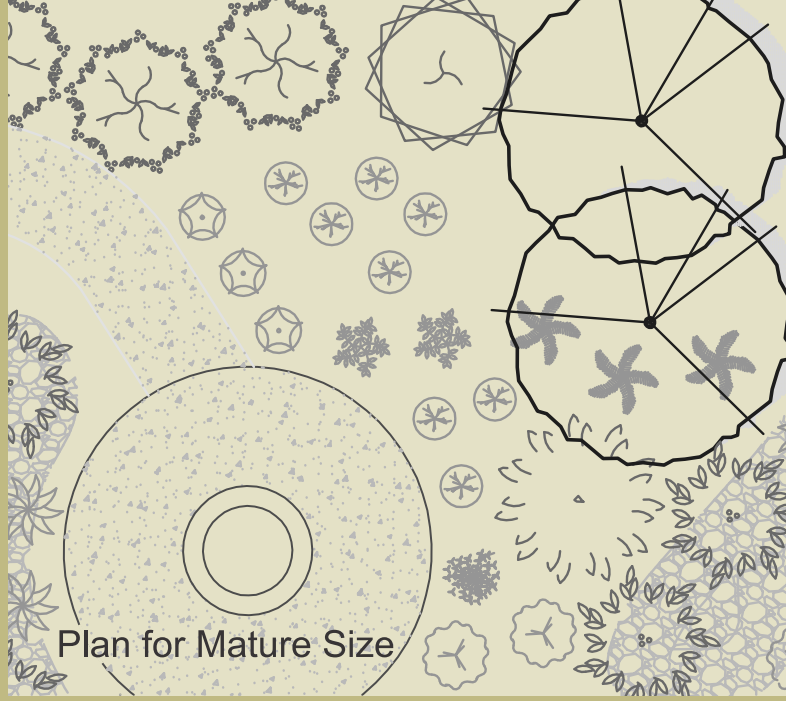
Take time to research how plants may appear in the spring, summer, fall and winter months, and how that may impact the look and function of your landscape. For example, evergreens hold their leaves throughout the year and are excellent for privacy and winter color. Other plants, such as Forsythia, may have colorful flowers during the early spring months, but not much afterwards. Visit **waterwisetips.org** for additional information on specific plants.

Make sure the plants you've selected are acclimated for this area. Plants that thrive in Bend typically fall within USDA Zones 3-5. Plant selection throughout the yard will vary by its exposure. Rhododendrons or Burning Bush prefer less intense north, east side exposures, whereas Russian Sage or Yarrow will take the intense south, west placement. The diverse geography within Bend has several natural microclimates that can also influence a plant's health. For example, areas around the base of Pilot Butte, near the banks of the Deschutes River, and those protected by cliffs or lava rock outcroppings may have unique sets of conditions and allow for more diverse plant selection. Structures like homes, garages, fences and walls can offer additional microclimates within your landscape.

This is also the time to think about a plant's size at full maturity and maintenance requirements. Will this plant eventually impede traffic or touch the house? Is it deciduous or does it keep its leaves? Will it need to be pruned annually? Will a plant's fruit attract the type of wildlife you're looking for? These are the types of questions that should be asked and answered before selecting plants for your Bend WaterWise landscape. The good news is that the choice is up to you! The OSU *Water-wise Gardening in Central Oregon* includes a wide selection of plants that can thrive in Bend.

Summer Blossoms

Choose Plants for Our Climate



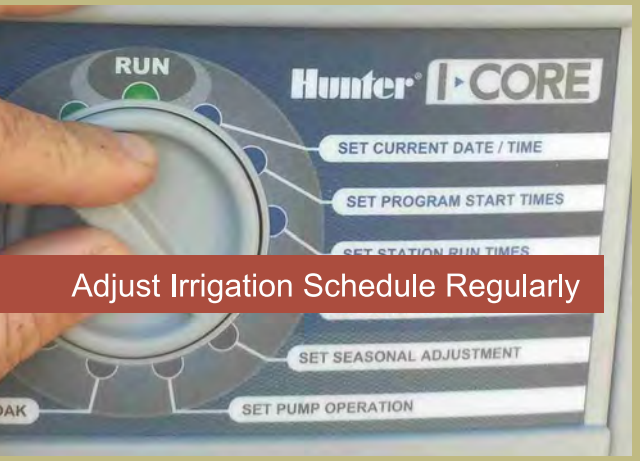
Plan for Mature Size

TRANSFORMATION TIPS
RIGHT PLANT – RIGHT PLACE

- Know how plants look and perform throughout the seasons
- Make sure plants are USDA Zones 3-5
- Review your site to determine if any microclimates exist
- Ensure plants will have adequate space at maturity

Spring Flowers

MAINTENANCE



Adjust Irrigation Schedule Regularly

Repair Broken Equipment

Maintaining Your Landscape Investment

A properly designed, installed and maintained Bend WaterWise landscape saves more than just water, it also saves time by reducing maintenance needs. Generally, the average landscape requires weekly maintenance of some combination of mowing, edging, weeding or more to keep it healthy and looking good. Bend WaterWise landscapes are different. They require more seasonal selective pruning, raking, adjusting of sprinklers or drip emitters, and checking for irrigation leaks. Ultimately, a landscape's maintenance requirement is determined by the landscape owner, but largely dependent on plant selection and landscape design.

Lawns bring another set of maintenance requirements. These can include mowing, edging, fertilizing, aeration or dethatching. Routine additions of compost are also likely necessary for those lawns that didn't get established on a properly amended soil. Although their water need is considerably higher than most shrubs, lawns can also be a part of a Bend WaterWise landscape when their size is designed for the intended use, the soil is amended properly and high efficiency irrigation components are used.

Regular irrigation maintenance is often overlooked. In addition to activating your irrigation system in the spring and winterizing it in the fall, there are regular steps you can take to ensure that you're using water wisely throughout the year. Conduct biweekly inspections of the irrigation system during the growing season, to ensure that there are no leaks and that water is going where it is supposed to go – the plant roots! You may find that the occasional drip emitter or sprinkler nozzle needs to be cleaned out or replaced. Make sure you're replacing like-for-like, as many of these look the same, but have different flow or precipitation rates. Mixing sprinkler types can result in dry or wet areas and make programming difficult. Regular irrigation schedule adjustments are necessary, too, if you don't have a smart irrigation controller that automatically adjusts in response to conditions like heat, rain and wind.

Mulch is one of the most important components of a Bend WaterWise landscape. A 2" to 3" layer of mulch covers the soil to minimize evaporation, reduce weed growth, cool root zone, and slow erosion and provides a nice, finished look. There are many mulch choices in various sizes and colors of bark or rock. Bark mulches are organic and will improve soil texture as they deteriorate. However, bark mulches require a thin layer of fresh mulch every few years. Shredded mulches tend to settle and stay in place better than bark nuggets which blow or wash away and need to be replaced fairly often. Rock mulches don't need replenishment very often, but they can radiate heat.

Fertilizing

Using a Thick Layer of Mulch Can Prevent Weeds

Clogged Nozzle

TRANSFORMATION TIPS

MAINTENANCE CONSIDERATIONS

- Maintenance is largely dependent upon plant choice and landscape design
- Lawns bring several additional maintenance requirements
- Regular irrigation inspections and adjustments are necessary
- Mulching has multiple benefits to the landscape

Keep Tools Sharp and Oiled

Mow Lawn High in Summer

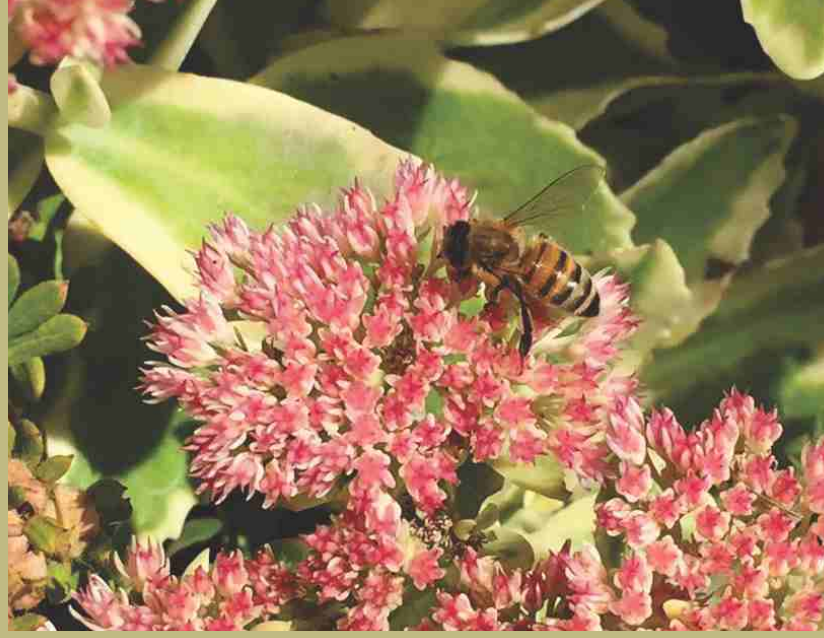
Freshly Mulched Planting Bed

Structural Pruning

REFERENCES & RESOURCES

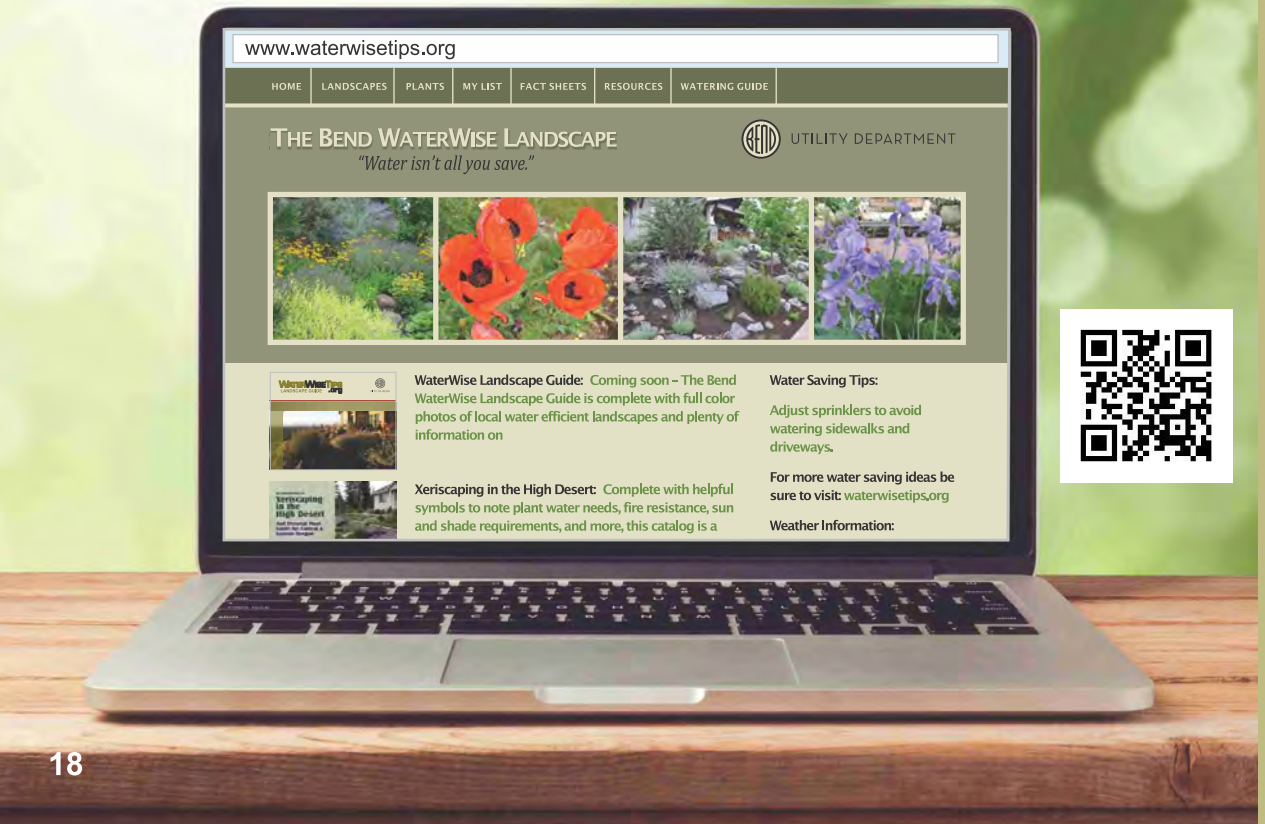
Additional information on water efficient landscape methods can be found in the references and resources below:

City of Bend WaterWise Program	**waterwisetips.org**
City of Bend Stormwater Program	**bendoregon.gov/cleanwaterworks**
Oregon State University Extension	**extension.oregonstate.edu**
EPA WaterSense	**epa.gov/watersense**
Irrigation Association	**irrigation.org**
Alliance for Water Efficiency	**allianceforwaterefficiency.org**
U.S. Bureau of Reclamation	**usbr.gov/pn/agrimet/**



Ready For More Bend WaterWise Landscapes?

Visit waterwisetips.org for hundreds of photos of local Bend WaterWise landscapes.



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Accommodation Information for People with Disabilities. To obtain this information in an alternate format such as Braille, large print, or electronic, please contact 541-317-3000 ext. 2 or email utilities@bendoregon.gov.

CITY OF BEND

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