

WATERWISE TIPS

TURF REMOVAL GUIDE [.org](http://TURFREMOVAL.WATERWISE.TIPS)



CITY OF BEND
WATER CONSERVATION

A Step-by-Step Guide to Plan and Complete Your Turf Removal Project

TURF REMOVAL



PROJECT STEPS

1

Project Planning

2

Site Preparation

3

Turf Removal

4

Efficient Irrigation

5

Planting

6

Maintenance



Landscape irrigation has the highest impact on the City of Bend water system during the summer. Conserving community water supplies creates resilience to drought.

Convert your thirsty lawn into a low-water use landscape. These landscapes are a colorful alternative to traditional lawns and can reduce landscape water need by an average of 23%, for a typical converted area based on past projects.

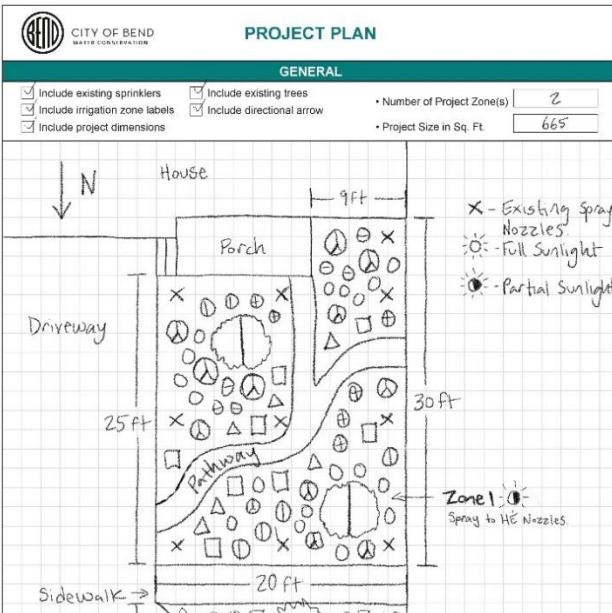
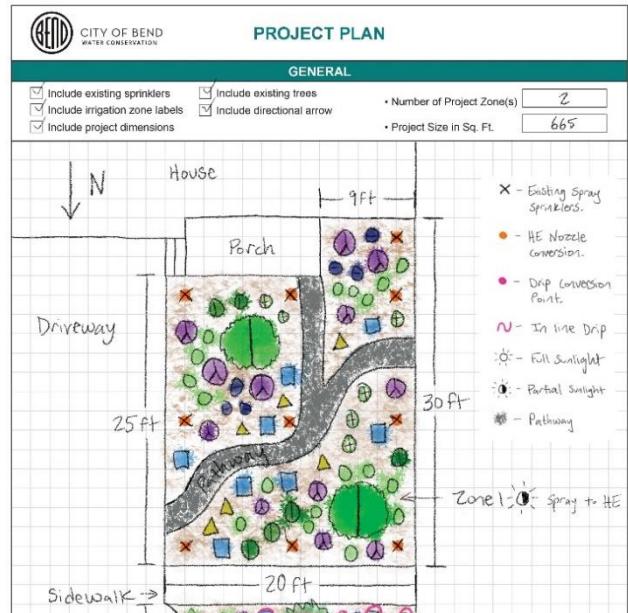


BYE LAWN... HIGH DESERT!

1. PROJECT PLANNING

To create a meaningful Project Plan, spend time considering the existing landscape conditions and restrictions.

1. Check homeowner's and neighborhood association landscape requirements for existing codes, covenants, or restrictions that outline landscape specifications.
2. Determine and measure the dimensions of your project area.
 - a. Avoid mixing plants with different water needs, hydrozones, and select a project area that consists of an entire irrigation zone.
3. Record the topography of the area to determine how water moves on the landscape.
 - a. Consider contouring the landscape to retain stormwater by adding a combination of berms and swales; keep in mind that removed sod can be used to build berms.
4. Observe how the sun covers the landscape throughout the day; note areas of full sun, partial sun, and shade.
5. Determine the new irrigation configuration based on the current sprinkler placement.
 - a. Incorporate irrigation for existing trees in the proposed design.
6. Select low water use plants based on hydrozones and sun exposure.
 - a. [Plant List- Pollinator Parkways](#)
 - b. [OSU Water-Wise Gardening In Central Oregon Guide](#)

PROJECT PLAN	
GENERAL	
<input checked="" type="checkbox"/> Include existing sprinklers <input checked="" type="checkbox"/> Include irrigation zone labels <input checked="" type="checkbox"/> Include project dimensions	
<input checked="" type="checkbox"/> Include existing trees <input checked="" type="checkbox"/> Include directional arrow <input checked="" type="checkbox"/> Include project dimensions	
• Number of Project Zone(s) 2 • Project Size in Sq. Ft. 665	
	
	
IRRIGATION	
• Current Irrigation Type: <input type="checkbox"/> Rotor - Overhead <input checked="" type="checkbox"/> Spray - Overhead <input type="checkbox"/> Drip <input checked="" type="checkbox"/> Proposed Irrigation Layout	• Proposed Irrigation Type: <input checked="" type="checkbox"/> High-Efficiency Rotary *Width must be >8' <input checked="" type="checkbox"/> Drip <input checked="" type="checkbox"/> In-Line <input type="checkbox"/> Point Source
• Proposed Planting Layout: *Approximately 10 plants per every 100 sq. ft. • Proposed Water Use: <input checked="" type="checkbox"/> Very Low <input type="checkbox"/> Low <input type="checkbox"/> Medium • Anticipated Species (shrub, grass, perennial) A. Purple Sage  B. Iron Bush  C. Indian Rice GRASS  D. Indian Fescue  E. Yarrow  F. Oregon Sunshine  G. Blue Fescue  H. Blue Leaf Phlox  I. Pink Leaf Phlox  J. Yarrow 	
PLANTING	
• Current Irrigation Type: <input type="checkbox"/> Rotor - Overhead <input checked="" type="checkbox"/> Spray - Overhead <input type="checkbox"/> Drip <input checked="" type="checkbox"/> Proposed Irrigation Layout	• Proposed Irrigation Type: <input checked="" type="checkbox"/> High-Efficiency Rotary *Width must be >8' <input checked="" type="checkbox"/> Drip <input checked="" type="checkbox"/> In-Line <input type="checkbox"/> Point Source
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Project plan examples with existing and proposed conditions in black & white (left) and color (right).

General

- Project size
- Project dimensions
- Number of project zones
- Existing sprinklers
- Irrigation zone labels
- Existing trees
- Directional arrow

Irrigation

- Current irrigation type
- Proposed irrigation type
- Proposed irrigation layout

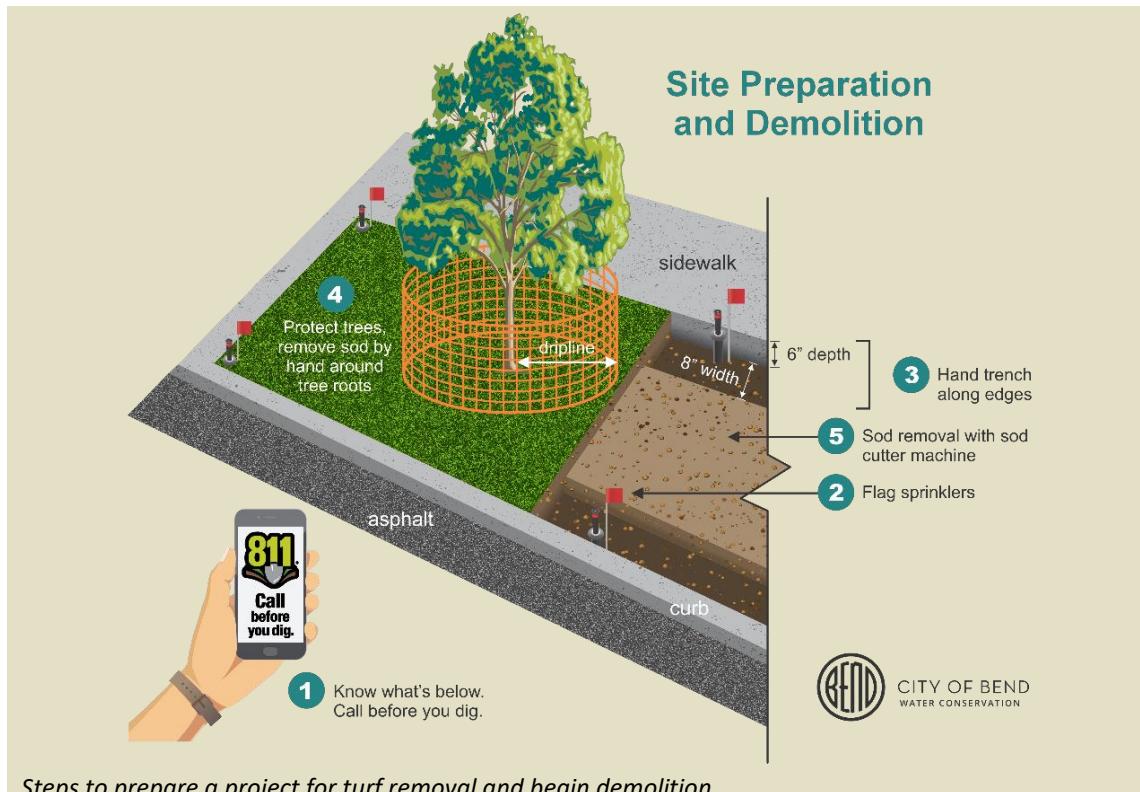
Planting

- Proposed planting layout
- Proposed plant water use
- Anticipated plant species

Include the above elements in the project plan.

2. SITE PREPARATION

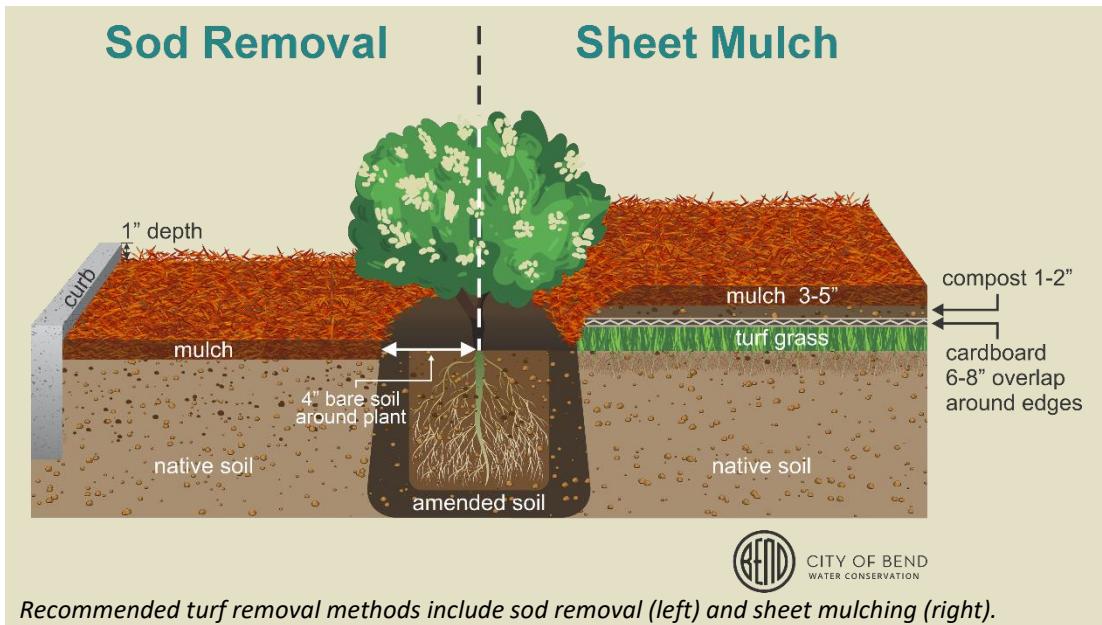
1. Call 811 for utility locates at least 2 days before you begin site preparation.
2. Remove rocks, twigs, and debris from your lawn.
3. Mow your grass on the lowest setting a few days before starting.
4. Water your lawn one to three days before starting to ensure it is moist at least four inches below the surface.
5. Mark any sprinkler heads or surface level roots to avoid damaging them
 - a. More on sprinkler conversions in Step 4- Efficient Irrigation.



Steps to prepare a project for turf removal and begin demolition.

3. TURF REMOVAL

There are several methods for converting lawn to a low-water use landscape. The size of your project and your penchant for hard work may help you determine the best method for you. Below are detailed steps for **Sod Removal** and **Sheet Mulching**.

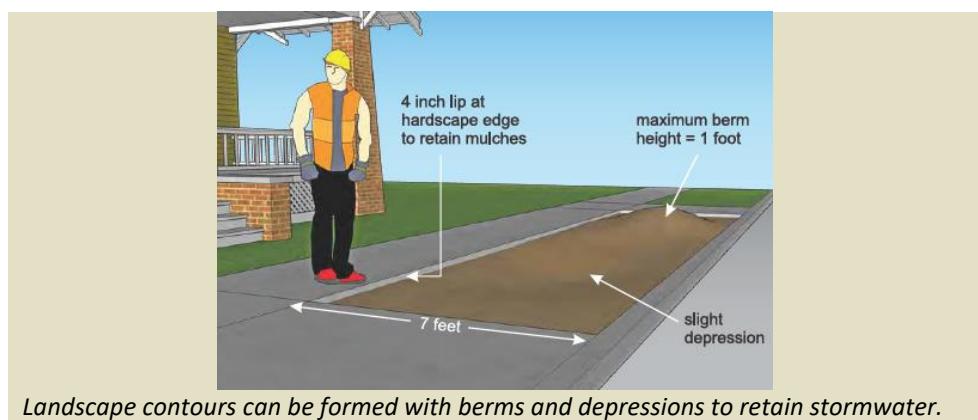


Other methods to remove lawn which are NOT recommended for Central Oregon include:

- Solarization: sterilizes soil and has specific temperature, light, and time requirements.
- Herbicide application: transports pollutants and chemicals to the soil and water table while having adverse effects on pollinators.

Removed sod can be used to create berms and swales which help prevent erosion while adding interest to the landscape. Utilize the removed sod to contour the landscape and retain stormwater by laying strips grass-side down, root side up, and covering with additional soil or compost.

- Reference the [Oregon Watershed Approach to Landscape Design](#) handbook for more information on how to incorporate these principals.



SOD REMOVAL

This method physically removes lawn, roots and soil without killing beneficial microorganisms and insects. Removal can be done **by hand** or with a **motorized sod cutter**— both options are labor intensive. Lawns with a lot of shallow tree roots will require careful hand work as mechanical removal with a machine can damage the roots.



Sod removal with a motorized sod cutter and rolled sod strips.

- Benefits: quick, efficient, no pesticide use.
- Materials: shovel, spade, edger, motorized sod cutter, optional: large truck or trailer for transporting sod if not reusing on-site.

1. **By Hand** (this option is strenuous and best applied to small yards or around tree roots): use a flat shovel and pick axe to cut the turf into strips. The cuts should be about four inches deep and about the width of the shovel. Start at one end of the strip and slide the flat shovel under the sod, cutting the roots.
2. **Motorized Sod Cutter** (this option is recommended for larger lawns): mechanical sod cutters are typically available at local tool rental companies. It requires some strength and control to operate the equipment. Be sure to ask the rental company for towing requirements or delivery options.
 - If you are comfortable operating the equipment yourself, always read the directions and operation manual accompanying each machine.
 - You may consider hiring a professional if you are uncomfortable operating the equipment or your turf area is extremely large.
3. With either hand or motorized removal, work carefully by hand around trees and large roots to avoid damaging them.
4. Once the sod strips are separated from the soil, roll them up from one end or cut them into smaller, more manageable pieces.
5. Remove any rocks and remaining clumps of grass.
6. Some sod pieces can be kept on-site and used to create berms in the landscape. Lay them grass-side down, root side up, and cover with additional soil or compost.
 - If you plan to add plants on the sod berm, add plenty of extra soil to optimize plant growth.

- Unused sod can be recycled at the Deschutes County Knott Landfill.

PROJECT PAUSE: complete Step 4, Efficient Irrigation, and Step 5, Planting, before adding mulch.

- Cover the remaining area with at least 3" of mulch.

SHEET MULCH

Sheet mulching uses layers of biodegradable material to block sunlight to decompose lawn and add nutrients back to the soil. The first layer is a biodegradable weed barrier (ex. cardboard, newspaper or construction paper) which is placed directly over the grass. Next, a layer of compost is used to cover the weed barrier followed by a layer of mulch placed over the top. Using layers allows the water to move through the material to the grass below, causing the grass to decompose over time.



Sheet mulch layers shown in a cross section with associated material depths.

- Benefits: improving soil health, zero green waste, no heavy equipment use, no pesticide use, minimizes weeds.
- Materials: shovel, hose, biodegradable weed barrier (ex. cardboard, newspaper, or construction paper), compost and mulch. *DO NOT USE PLASTIC, it is not biodegradable.*
- Limitation: sheet mulching is not an acceptable method of turf removal in the Right of Way (street strip).

- Calculate the amount of materials required for your lawn by measuring the area.
 - The cardboard or newspaper must overlap by six inches to avoid light penetration.
 - The compost and mulch, combined, must cover the area at least five to six inches deep.
- Dig out the edges of the lawn three inches deep to prevent run-off and erosion; create a trench eight to twelve inches wide next to walkways, driveways, and the lawn perimeter so that the finished edge will be level with the existing grade.



Sheet mulch process adjacent to hardscape to eliminate mulch overflow by establishing an edge.

3. Removed sod pieces can be kept on site and used to create berms in the landscape. Lay them grass-side down, root side up. Unused sod can be recycled at the Deschutes County Knott Landfill.

PROJECT PAUSE: complete Step 4, Efficient Irrigation, and Step 5, Planting, before continuing with the sheet mulch process.

If you plan to install drip irrigation, the drip tubing will be below the cardboard layer; this will help prevent heave of the tubing from freezing events.

4. Lay out the selected biodegradable weed barrier across the lawn using one layer of cardboard or six layers of newspaper. Remove any tape or labels from boxes.
 - a. Wet down the weed barrier as you go to keep it in place.
5. Spread one to two inches of compost directly over the biodegradable weed barrier.
6. Spread at least three inches of mulch on top of the compost; the combination of compost and mulch should equal a total of four to seven inches.
7. Wet down the entire project area to kick off the decomposition of the lawn.
8. Continue to water the lawn about once a week to continue decomposition of the lawn which may take one to three months to decompose; the layers will control weeds and retain soil moisture.

4. EFFICIENT IRRIGATION

There are two primary ways to irrigate your landscape after conversion: drip irrigation or high-efficiency sprinkler nozzles. Existing sprinkler systems **must** be converted to efficient irrigation. For dimensions less than 8ft, use drip irrigation to avoid overspray. For areas greater than 8' wide, high-efficiency sprinklers may be considered as an option, in addition to drip.

As a reminder, your landscape conversion must encompass **one complete irrigation zone**. Based on your project and existing irrigation system, an additional irrigation valve or zone extension may be required. You may consider altering your project scope or hiring a professional, if needed.

DRIP

Two forms of drip irrigation are **inline** drip irrigation and **point-source** drip irrigation. Whichever drip type you select, either can be installed to an existing irrigation system with a **drip conversion kit**.

1. A **drip conversion kit** looks like a traditional sprinkler spray body but includes a pressure regulator and an in-line filter to keep drip emitters from clogging. Instead of a spray nozzle on top of the sprinkler, the kit has a $\frac{1}{2}$ " fitting which connects to $\frac{1}{2}$ " drip tubing with either an elbow or T fitting.
 - a. Replace one existing spray head with the conversion kit and attach the drip tubing—either *inline* tubing or distribution tubing for *point-source*.
 - b. Cap the remaining spray heads by replacing the removable top of the spray head with a black cap, or replace the entire spray head with a white PVC cap.

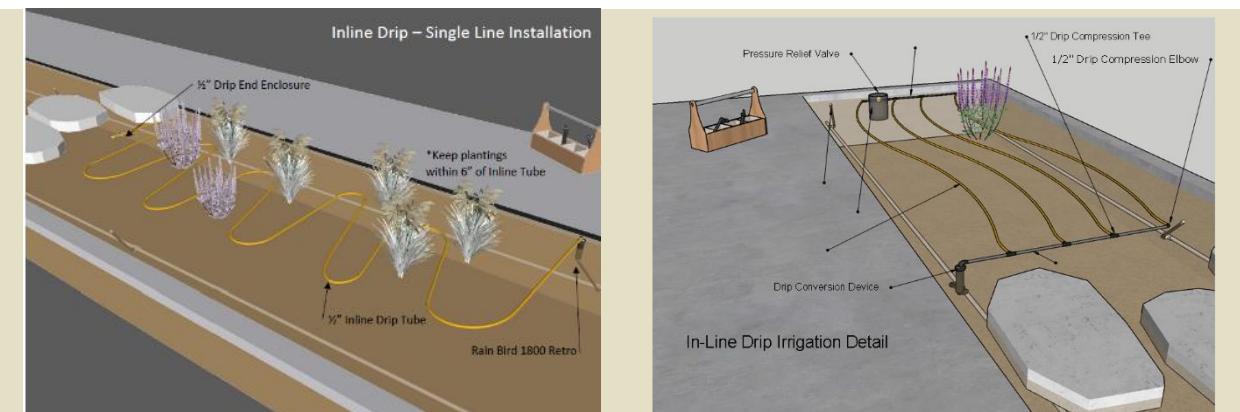


Drip irrigation retrofit kit installation at the point of connection shown from the [Rain Bird: Landscape Drip Conversion Guide](#). From left to right- identify the point of connection, remove the spray head, replace with the retrofit kit including the elbow or T fitting, then connect the drip tubing.



All other heads will need to be capped with by either removing the sprinkler and adding a threaded cap (left) or adding a sprinkler cap to the existing sprinkler (right).

2. **Inline** drip irrigation is best for dense plantings or plantings spaced closer than two feet on center. Inline drip irrigation has emitters inside of $\frac{1}{2}$ " tubing, spaced evenly apart.
 - a. Attach inline tubing to the fitting on top of the conversion kit then lay the tubing throughout the planting area in an organized, grid fashion. Use additional T and elbow $\frac{1}{2}$ " fittings to connect tubing as needed. Avoid the emitters when cutting the tubing.
 - b. Bury 2" below grade and secure with U-shaped stakes.

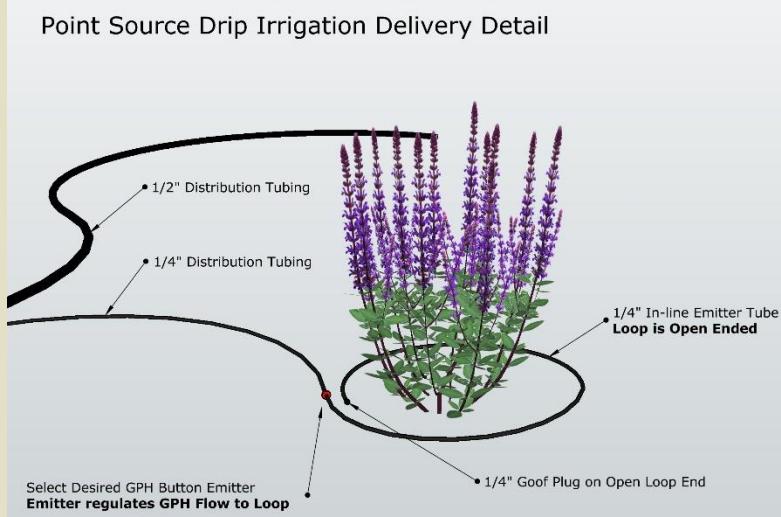


Inline drip irrigation- configuration with a single line installation (left) and a grid installation (right).



Inline drip irrigation- grid installation example demonstrating the uniform water application every 12".

3. **Point source** drip irrigation is recommended for less dense plantings. Point source drip has individual emitters at the plant, connected by a smaller $\frac{1}{4}$ " tubing that is inserted into the solid $\frac{1}{2}$ " distribution tube that runs throughout the landscape.
 - a. Attach $\frac{1}{2}$ " distribution tubing to the conversion kit head and lay it throughout the planting area.
 - b. With a punch tool, insert a $\frac{1}{4}$ " fitting into the $\frac{1}{2}$ " tubing and attach the $\frac{1}{4}$ " tubing. Run $\frac{1}{4}$ " tubing to individual plants. Use a $\frac{1}{4}$ " T fitting to run two lines to opposite sides of the plant. Install appropriate size emitters at the end of the $\frac{1}{4}$ " tubing.
 - c. Bury 2" below grade and secure with U-shaped stakes.



Point source drip irrigation- configuration with distribution tubing and inline emitter tubing.



Point source drip irrigation- example demonstrating water application to individual plantings.

4. **Tree irrigation** is essential for existing trees. Additional bubblers (2 or more depending on the size of the tree) can be added to ensure the tree receives adequate water. Alternatively, multiple rings of drip tubing can be installed around the tree.



Tree irrigation to an established tree with multiple rings of inline drip tubing (left) and bubbler nozzles (right).

HIGH-EFFICIENCY SPRINKLERS

High-Efficiency irrigation nozzles apply water at a slower rate than standard nozzles and offer greater distribution uniformity due to multi-trajectory or oscillating streams. Three popular HE Nozzles are Hunter MP Rotators, Rainbird HE Nozzles, and Toro Precision Series Spray Nozzles. All nozzles in an irrigation zone should be the same brand and size to ensure matched precipitation.

1. Replace standard nozzles with HE nozzles on existing sprinklers. Select the nozzle based on size and arc requirements for the planting area.
2. Test the irrigation zone and adjust as needed to avoid overspray.
3. Learn more about HE nozzles here: [DIY VIDEO high efficiency nozzles](#)



High-efficiency irrigation- rotary nozzle applying overhead irrigation to native plantings.

5. PLANTING

The two best times to plant in Central Oregon are June and September.



Prepare to plant by laying out plantings- consider irrigation requirements and maturity size.

1. Layout your plants in the planting area. Plan for plant heights and width at maturity.
2. Excavate the hole 2-3x larger than container
 - a. For sheet mulched yards, pull the mulch back and cut through the cardboard to dig into the soil- removing sod around the plant if not fully decomposed.
 - i. [Check out this video of planting in sheet mulched areas](#)
3. Water inside the excavated hole if soil is very dry.
4. Add supplements if desired (mycorrhiza, compost, fertilizer) and mix with native soil.
5. Use your knuckles or a knife to score any bound roots on the plant.
6. Be sure the top of root ball is at grade and back fill with soil.
7. Leave a small basin around the plant for water retention and ensure there is no mulch or grass within a three-inch radius of the plant.
8. Water thoroughly.
9. Test irrigation to be sure it is reaching plant material. Adjust drip lines if necessary.

10. Refer to this [Irrigation Card](#) for controller scheduling.
11. You may want to fence or cover the plants to protect from deer browsing. Once the plants are established, deer protection may be removed.

Check out these [Planting and Maintenance](#) instructions from Pollinator Pathways!

6. MAINTENANCE

1. Check irrigation system periodically. Run a two-minute test cycle for all zones. Check for leaks and be sure that water is reaching the plant material. As plants become established, irrigation may need to be expanded.
2. Use Smart Technology or manually change seasonal adjust percentage to capture water savings in the spring and fall months.
3. Add mulch annually or as needed. For fire safety reasons, the first five feet around any structure should be non-combustible such as rock, pavers, or bare dirt.
4. Periodically weed and remove grass sprouts as needed.



The Seasonal Adjust (Water Budget) feature of a controller can be adjusted to the above percentages when the run time is programmed for the peak water need in July.

Questions? Reach out to us at conservation@bendoregon.gov