

Behind the beauty of the High Desert landscape lies many factors that create challenges for any gardener, from the novice to the expert. Learning how to work with these challenges can allow you to have a successful and beautiful garden. Some of the main factors that contribute to these difficulties include temperature, precipitation, soil types, elevation, USDA hardiness zones and microclimates. Each of these issues will be discussed below and hopefully expand your knowledge and assist you in all of your gardening adventures.

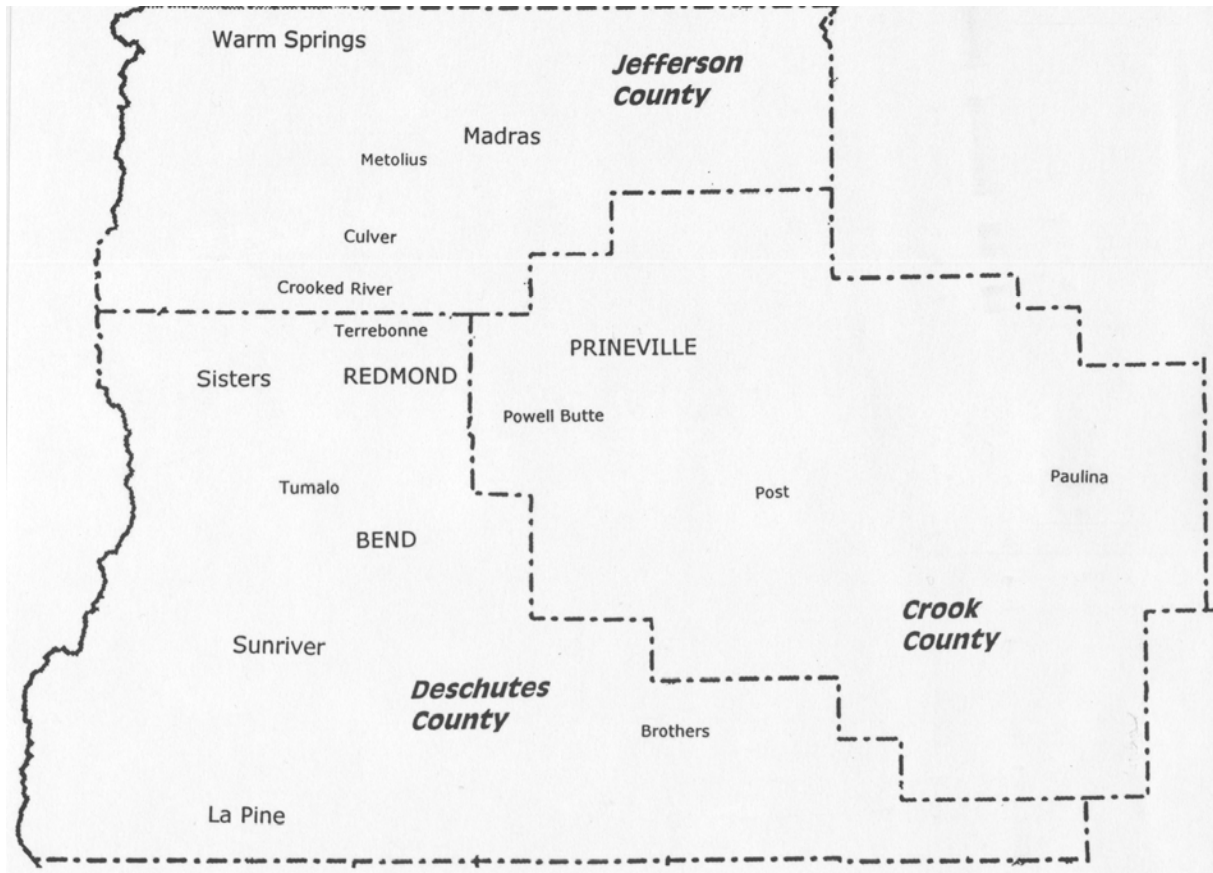
What zone are we??

What is a hardiness zone or rating, and what zone is Central Oregon considered? The term "hardiness" refers to the ability of a plant to withstand an average minimum temperature. Often times when we go to purchase plants, the catalog or plant tag will indicate hardiness zone followed by a number. This number is based upon the hardiness zones derived from a map put out by the by the United States Department of Agriculture (USDA). They prepared a map based on the average annual minimum temperatures recorded throughout North America from 1974- 1986. There are eleven designated zones with one being the coldest climate and eleven being the most temperate zone. When choosing a plant, you would want to pick a plant that falls within your zone or is a zone colder. For example, if your area is designated as hardiness zone 4, you will want to purchase plant material hardy to zone 4 or less such as zone 3. There are other climate zone or hardiness maps in existence, but these are not utilized universally as is the USDA Hardiness Zone map. An example would be the climate zones (which is different than a hardiness zone) designated by the popular Sunset Western Garden Book. Their climate zone information, although very informative will not be designated on plant tags or in catalogs. Hardiness ratings or zones are intended to be used only as a guide, not an absolute for plant selection and survivability. Especially being the case, here in Central Oregon, where we have several microclimates. There are numerous factors that contribute to whether or not a plant will survive besides just minimum temperatures. Some of these factors include soil type, rainfall, heat tolerance, and exposure to wind and sun. According the USDA Hardiness Zone map, Central Oregon is placed in Zone 5 (-20° to -10°). However, this is really oversimplified given our many microclimates. The following chart , on the next page is a more accurate guideline to use when looking at plant hardiness for Central Oregon, but remember to think about microclimates within your own landscape.

Soils

Most Central Oregon soils are coarse, have a sandy texture and tend to be very sterile with minimal organic matter in them. These soils need to be amended with organic material such as compost or aged manure to improve water holding capacity, increase soil micro-organism activity levels, and improve the overall health of the soil. The soil pH is generally between 6.0 and 7.0 which is neutral and suitable for most plants. In some areas the soil may be a bit more alkaline (pH above 7.0) and require some soil amendments to reduce the pH. A soil test is beneficial in determining soil pH and the nutrient analysis of your soil.

Below is a map of Crook, Deschutes, and Jefferson counties and a chart of plant hardiness zones. Use the hardiness zone guide in selecting plant material for your landscape.



Location	USDA Hardiness Zone
Bend	3-5
Crooked River Ranch	4-5
Culver	4-5
La Pine	3-4
Madras	4-5
Prineville	3-5
Redmond	3-5
Sisters	3-5
Sunriver	3-4
Terrebonne	4-5
Tumalo	3-5
Warm Springs	4-5

Precipitation



We often think of precipitation in terms of rain. However, here in the high desert, our natural precipitation ranges from 8-22" per year, most of which falls during the winter season as snow.

**Monthly Mean Precipitation (Inches)
collected from 1971-2000¹**



Month	Bend	La Pine*	Madras	Prineville	Redmond	Sisters
January	1.76	3.46	1.25	1.14	1.20	2.32
February	1.13	2.59	.93	1.00	.70	1.72
March	.92	2.01	.89	.95	.86	1.17
April	.70	1.32	.83	.80	.57	.89
May	.90	1.17	.95	1.06	.58	.79
June	.75	1.01	.58	.84	.60	.60
July	.62	.81	.53	.58	.26	.45
August	.60	.84	.48	.45	.71	.50
September	.49	.81	.46	.41	.34	.48
October	.62	1.33	.76	.76	.55	.98
November	1.46	3.12	1.39	1.30	.99	2.14
December	1.78	3.56	1.21	1.20	.85	2.15
Year	11.73	22.03	10.26	10.49	8.00	14.19

*climate data taken from the Wickiup Dam, 10 miles west of La Pine

Elevation




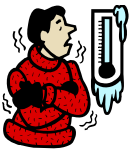
Central Oregon increases in elevation as you go from north to south. The elevation in Warm Springs is 1000 feet increasing to 4200 feet in La Pine. Higher elevations tend to have winters that are longer and colder. Other effects of higher elevations include lower night temperatures, especially during the growing season, and increased intense sunlight year round.

Location	Elevation (feet)
Bend	3650
La Pine	4200
Madras	2230
Prineville	2840
Redmond	3060
Sisters	3180
Sunriver	4156
Warm Springs	1000

Temperature

Many people are attracted to Central Oregon because of the large number of sunny days we experience here. Interestingly enough, these sunny days are responsible for the occurrence of radiational cooling, resulting in frost any time of the year. The higher elevations are especially susceptible and can have frost during the summer months. Established plant material in the landscape will suffer frost damage at temperatures of 24°F or below. More tender plants will freeze between 24°F—32°F. Central Oregon's climate has a wide range of temperature extremes between day and night. These temperature fluctuations often cause plants to bud out prematurely, only to get nipped by the frost at a later date. Relatively low evening temperatures limit plant growth and the production of some heat-loving crops such as tomatoes, peppers, eggplant, and melons. Our Spring and Autumn months do not warm up and cool down gradually which is often the case in more temperate regions. The growing season ranges from 60-120 growing days with the shorter seasons occurring in the higher elevations and southern regions of Central Oregon such as La Pine and Sunriver. We also experience many microclimates here in Central Oregon. A microclimate is defined as the climate of a small area (e.g. your backyard or even a portion of your backyard) as opposed to that of a larger region. Some of the factors that determine a microclimate include cold pockets, hills, and the location of houses or other structures. Microclimates can influence plant adaptability in your own backyard and should be considered when selecting plant material. The growing season or time period during the year where you can achieve plant growth is variable each year due to our low evening temperatures and the frost factor. However we can approximate the number of days you generally have to grow plants during the growing season, based on averages taken over the years.

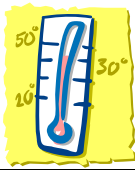
Location	Average Growing Season (# days)
	
Bend	80-90
La Pine	70-80
Madras	90-100
Prineville	80-90
Redmond	80-90
Sisters	75-85
Sunriver	70-80
Warm Springs	100-110



Median Frost Dates collected from 1971-2002¹

Location	Last Occurrence in Spring of 24°F	Last Occurrence in Spring of 32°F	First Occurrence in Fall of 24°F	First Occurrence in Fall of 32°F
Bend	May 10	June 20	October 15	September 2
LaPine*	April 30	June 20	October 11	September 8
Madras	April 16	May 27	November 1	October 3
Prineville	May 5	June 28	October 3	August 31
Redmond	May 5	June 17	October 17	September 9
Sisters	May 23	July 10	September 20	August 17

*climate data taken from the Wickiup Dam, 10 miles west of La Pine



Monthly Mean Temperature (°F) collected from 1971-2000¹

Month	Bend	La Pine*	Madras	Prineville	Redmond	Sisters
January	31.2	28.8	33.5	31.5	30.4	29.6
February	34.4	31.8	37.9	35.9	36.7	33.0
March	38.9	36.2	42.8	39.9	39.7	38.0
April	43.7	41.5	47.4	44.4	43.6	42.6
May	50.3	48.8	54.2	51.3	51.3	49.0
June	57.0	56.3	60.9	58.7	59.4	56.2
July	63.5	63.1	67.4	64.3	66.8	62.6
August	63.1	62.8	66.8	63.7	64.8	62.4
September	55.5	55.7	59.3	56.3	57.2	54.8
October	47.0	46.8	49.1	47.2	48.5	45.9
November	37.0	36.2	39.6	37.3	38.4	35.6
December	31.2	29.6	33.1	31.3	34.1	29.6
Year	46.1	44.8	49.3	46.8	47.5	44.9

Monthly Maximum and Minimum Mean Temperatures (°F)
collected from 1971-2000¹

Month	Bend	La Pine*	Madras	Prineville	Redmond	Sisters
January	39.7 / 22.6	38.6 / 18.9	43.0 / 24.0	41.9 / 21.0	39.2 / 21.6	39.1 / 20.0
February	44.1 / 24.7	42.4 / 21.2	48.7 / 27.1	48.1 / 23.7	46.9 / 26.4	43.2 / 22.8
March	50.6 / 27.2	47.2 / 25.1	56.1 / 29.4	54.5 / 25.3	51.9 / 27.6	49.8 / 26.1
April	57.4 / 30.0	53.3 / 29.6	62.7 / 32.0	60.7 / 28.0	57.5 / 29.7	56.7 / 28.5
May	64.9 / 35.6	61.7 / 35.8	70.8 / 37.5	68.5 / 34.1	66.4 / 36.1	64.6 / 33.4
June	72.8 / 41.2	70.3 / 42.2	78.7 / 43.1	77.0 / 40.3	75.8 / 43.0	74.0 / 38.3
July	80.7 / 46.2	79.5 / 46.7	87.5 / 47.2	85.8 / 42.8	85.1 / 48.2	83.4 / 41.7
August	80.6 / 45.6	80.0 / 45.5	87.4 / 46.2	85.7 / 41.6	82.2 / 47.2	83.6 / 41.1
September	72.4 / 38.6	72.9 / 38.5	79.2 / 39.4	77.8 / 34.7	74.3 / 40.1	74.8 / 34.7
October	61.7 / 32.2	61.8 / 31.8	66.3 / 31.9	65.7 / 28.6	63.5 / 33.5	62.8 / 28.9
November	46.3 / 27.6	45.3 / 27.1	51.0 / 28.1	49.4 / 25.2	48.3 / 28.3	45.8 / 25.3
December	39.6 / 22.7	38.6 / 20.5	42.9 / 23.3	41.7 / 20.8	43.2 / 24.9	39.2 / 20.0
Year	59.2 / 32.9	57.6 / 31.9	64.5 / 34.1	63.1 / 30.5	61.3 / 33.8	59.8 / 30.1

*climate data taken from the Wickiup Dam, 10 miles west of La Pine



Tips for Cold-Climate Gardening

Below are some basic tips to extend the growing season in your area and to help you find ways to successfully garden. OSU provides over 70 other garden publications available to you at little to no cost.

- Use season extenders such as row cover (to prevent frost damage), walls-o-water (for tomatoes), cold frames, and greenhouses.
- Winter water during periods of drought if the ground is warm enough to accept water. Every 6-8 weeks give your plants a deep soak to prevent winter desiccation.
- Mulch around your perennials to insulate them for the winter.
- Select adaptable plant material for your areas and be sure to put the right plant in the right place. Consider mature size, light and water requirements of the plants you select.
- Protect plants from wind by planting a windbreak or planting on the east side of your home.
- Add 14 days onto the number of days given for maturation on the seed packet for direct seed vegetables and flower seeds due to our cool evening temperatures.

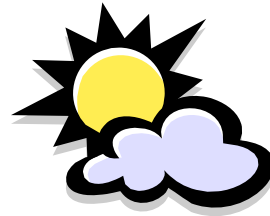
Listed below are several websites that will give climate data for the Central Oregon Region.

<http://www.ocs.oregonstate.edu/>

<http://www.wunderground.com/>

<http://www.cnn.com/WEATHER/nw/OR/BendOR.html>

<http://www.bendbulletin.com/news/weather.cfm>



Sources:

Bauer, Michael. 1994. The Central Oregon Climate.

¹Oregon Climate Service. Corvallis, Oregon

Sunset Western Garden Book. 2001. Sunset Publishing Corporation

Detweiler, Amy Jo. 2006. OSU Extension Service, Deschutes County.



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