Weather and Climate of the Rogue Valley
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The Rogue Valley region is one of many intermountain valley areas along the west coast of the United States. Nestled in the southwestern portion of Oregon, the landscape of the Rogue Valley is extremely diverse, coming from the joining of three mountain ranges of varying ages and structure: the Klamath and Siskiyou Mountains to the southwest to southeast, the Coastal Range to the west, and the Cascades to the east and north. The region is drained mainly by the Rogue River and its major tributaries; the Applegate River, the Illinois River, and Bear Creek.

At the largest scale, the weather and climate of the region is mainly influenced by the North Pacific Ocean and the westerly winds of the mid-latitudes. The maritime air masses that originate over the Pacific are cooled by the ocean currents offshore and moderate the climate of the region. Seasonally the west coast undergoes shifts between cooler, moister conditions in the winter with a strengthening of the Aleutian Low that brings storms into the region; to warmer, drier conditions in the summer that are associated with the dominance of the Pacific High.

On a regional scale, the general north-south or northwest-southeast oriented valleys, with their proximity to the Pacific Ocean and the number and height of mountain barriers, help to create climate conditions of wetter and cooler areas in the western parts of the region and warmer and drier eastern areas. At the local scale, site differences in elevation, topography, and orientation to the sun influence the variation in gardening potential. In terms of elevation, temperature decreases 3.5°F for every 1000 feet on average, therefore higher elevations can be more prone to freezes or frost and will have a shorter growing season. However, inversions (an increase in temperature with height) can alter this condition in valley areas. In the fall, winter, and spring it is common for cold air to drain to the lower elevations and, when combined with heat loss at night, leaves the coldest air in the valley bottoms and warmer air in an area called a thermal zone. The thermal zone in our valleys is typically 200-400 feet above the valley bottoms and can be approximated visually by the upper level of the fog which commonly forms in the valleys. Small topographical variations (e.g., a dip in the landscape), often in combination with obstructions such as trees or buildings, can also act as areas where cold air pools and should be avoided or altered to allow good air drainage.

The orientation of the garden plot and solar obstructions also need to be considered in order to determine the growth and ripening potential of any garden. The orientation of the garden plot (i.e., the aspect or the direction the land faces) will influence many decisions from what to plant to how much to irrigate. Northerly facing sites will typically have cooler temperatures with greater frost potential, slowed growth, but lower maximum temperatures during the hottest time of the summer. Easterly facing sites will also have slower growth potential, but receive good morning sun and typically have lower frost potential. Southerly facing sites will typically see the strongest growth potential but have high maximum temperature stress potential and therefore higher irrigation requirements. A westerly facing site will typically have lower morning sun but higher exposure to late afternoon sun. A location that is open to the sun's path across the sky will be able to grow warmer climate crops, while one that has less hours of incoming solar radiation due to obstructions, such as trees, will likely be limited to cooler season crops or will not fully ripen warmer climate crops. A solar path diagram can help in understanding how any garden plot will experience both daily and seasonal solar receipt potential (see the references for one source of a solar path diagram).

Weather and climate are observed at numerous sites within the Rogue Valley region. The main station from which most television, radio, and newspaper reporting comes from is the Medford Weather Service Office (WSO) site at the airport. Unfortunately, this station is located in one of the warmest and driest locations in the valley making direct comparison to most places were people garden difficult. Other locations that have varying amounts of climate information include; Applegate, Ashland, Cave Junction, Grants Pass, the Medford AgriMet station, Ruch, and Williams. Research and experience in the region reveals that the Medford AgriMet station, located at the Southern Oregon Research and Extension Center on Hanley Road between Medford and Jacksonville, represents the average of all stations throughout the region. Table 1 shows the complete 30 year climate normal data for the Medford AgriMet station. The location has an annual mean temperature of 66°F with an April-October period of 60.6°F. Rainfall averages just over 21 inches for the year with less than 15% of it coming during the growing season. Winter temperatures below freezing and summer temperatures above 90°F are common, with over 97 and 40 days, respectively. Across the other climate stations, July average maximum temperatures range from the upper 80s to the lower 90s, January average minimum temperatures range from the upper 20s to the lower 30s, average growing season temperatures vary from the upper 50s to the lower 60s, and precipitation varies from 18-60 inches across the region (however some locations can get as low as 12 inches) (Table 2). The growing season, defined by the median dates of the first and last 32ºF frost, varies from 138-174 days, with the average last and first frosts occurring on May 7 and October 9, respectively (Table 3).

In terms of climate classification, the National Oceanic and Atmospheric Administration (NOAA) define the region as the Southwestern Valleys climate zone. These climate zones are regions within a state that are as climatically similar as possible and results in the majority of Douglas, Josephine, and Jackson counties in the Southwestern Valleys climate zone. Classifying climates specifically for plants, the two most widely used climate zone maps are the Sunset Zones, also known as the Western Plant Climate Zones, and the USDA Hardiness zones. Sunset zones were developed by the University of California Cooperative Extension and popularized in Sunset Magazine and their *Western Garden* book. Sunset zones are based on a combination of extremes and averages of minimum, maximum, and mean temperature, rainfall, humidity, and the length of the growing season. As such, this system proves the most useful when trying to judge plant hardiness and adaptability to a certain region. The Southwestern Valleys of Oregon fall mostly in zone 7, which is defined as having a growing season of May to early October with hot and dry summers and winter time extreme lows that vary from 9-23°F. In contrast, the USDA zones are more widely used; however, these zones are solely based on the average minimum temperature during the winter in a given region. Therefore, the USDA Hardiness zones are best used for determining winter hardiness or survivability. Using both zone maps, one finds that the region's seasonal contrast between summer and winter suit plants that need dry, hot summers and moist, but only moderately cold winters.

Weather and Climate Resources

Telephone: (541)-779-5990 (NOAA-National Weather Service Forecast Office)
Radio: WXL – 162.40 mhz (NOAA Weather Radio)
Internet:

- National Weather Service, NOAA, Medford, OR - http://www.wrh.noaa.gov/mfr/
- National Weather Service, NOAA, Portland, OR - http://www.wrh.noaa.gov/pqr/

- Oregon Climate Service (OCS), Office of the State Climatologist, Oregon State University, Corvallis, OR - http://www.ocs.orst.edu/
- Western Regional Climate Center (WRCC), National Oceanic and Atmospheric Administration (NOAA), Reno, NV - http://www.wrcc.dri.edu/
- Climate Diagnostics Center (CDC), NOAA-Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO, - http://www.cdc.noaa.gov/USclimate/
- The Pacific Northwest Cooperative Agricultural Weather Network (AgriMet), U.S. Department of the Interior, Bureau of Reclamation - http://www.usbr.gov/pn/agrimet/
- Solar Path Chart – University of Oregon's Solar Radiation Monitoring Laboratory (http://solardat.uoregon.edu/SunChartProgram.html)

Table 1: Monthly means and extremes from the 1971-2000 climate normals for the Medford AgriMet Station, Hanley Road, Jacksonville, Oregon.

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean Temperature (°F)													
Maximum	46.8	53.1	57.9	64.2	71.9	79.9	87.9	87.0	79.8	67.0	51.3	45.1	66.0
Minimum	30.6	32.4	34.6	37.5	42.1	47.5	51.4	50.7	44.4	37.3	34.2	30.7	39.5
Mean	38.7	42.8	46.3	50.9	57.0	63.7	69.7	68.9	62.1	52.2	42.8	37.9	52.8
Extreme Temperature (°F)													
Maximum	68	77	79	93	96	104	105	109	102	95	73	68	109
Minimum	9	0	20	25	29	30	35	37	29	17	9	-8	-8
Precipitation (inches)													
Monthly mean	2.77	2.32	2.26	1.61	1.41	0.77	0.50	0.57	0.95	1.51	3.20	3.27	21.14
Extreme 24 hr	2.35	2.02	1.84	0.90	1.34	0.91	1.30	0.90	3.66	1.44	2.12	2.54	3.66
Snowfall (inches)													
Monthly mean	1.0	0.3	0.2	0	0	0	0	0	0	0	0	0.9	3.0
Average number of days where Temperature is:													
Maximum 90°F or more	0	0	0	0	1.6	5.8	13.9	12.7	5.5	0.3	0	0	40
Maximum 32°F or less	0.2	0.1	0	0	0	0	0	0	0	0	0	1.0	1.3
Minimum 32°F or less	19.8	15.3	12.5	7.5	2.2	0.1	0	0	0.9	7.5	13.4	18.5	96.8
Minimum 0°F or less	0	0	0	0	0	0	0	0	0	0	0	0.3	0.2
Average number of days where Precipitation is:													
.01 inches or more	12.8	11.1	12.9	10.1	7.7	5.1	2.5	2.6	4.0	6.4	14.0	13.8	106.2
.10 inches or more	5.5	5.3	5.8	4.4	4.0	2.3	1.2	1.5	2.3	3.8	7.1	7.3	52.5
.50 inches or more	1.3	1.2	1.3	0.6	0.5	0.3	0.2	0.3	0.5	0.8	1.9	1.7	10.9
1.00 inches or more	0.4	0.2	0.3	0	0.1	0	0	0	0.1	0.2	0.6	0.6	2.6
Degree Days													
Heating degree-days @ 65°F	824	629	573	424	257	100	27	20	120	381	669	846	4854
Growing degree-days @ 50°F	4	10	26	89	235	416	602	594	373	127	11	3	2492

Data Source: Oregon Climate Service

Table 2: Average climate characteristics for representative weather stations in the greater Rogue Valley.

Station (Elevation)	Average July Maximum Temperature (ºF)	Average January Minimum Temperature (ºF)	Average Mean Growing Season[1] Temperature (ºF)	Growing Degree Days (Apr-Oct., 50ºF base)	Annual Precipitation (inches)
Applegate (1276 ft.)	NA[2]	NA	NA	NA	25.2
Ashland (1750 ft.)	86.7	29.1	59.3	2354	19.8
Cave Junction (1280 ft.)	91.9	32.0	62.1	2504	62.6
Grants Pass (960 ft.)	88.8	31.1	60.8	2738	31.0
Medford Airport (1300 ft.)	90.2	30.9	63.1	2910	18.4
Medford AgriMet (1457 ft.)	87.9	30.6	60.6	2436	21.2
Ruch (1549 ft.)	89.6	29.6	61.3	2590	25.8
Williams (1450 ft.)	NA	NA	NA	NA	33.6

*All data are from the 1971-2000 climate normals for that station, except for Applegate and Williams, which are from monthly climate summaries over for 1979-2002 and 1900-2002, respectively (OCS and WRCC, 2003).

[1]April through October

[2]NA = data not available.

Table 3: Median frost dates for representative weather stations in the greater Rogue Valley.

Station (Elevation)	Median Date of Last Spring Occurrence				Median Date of First Fall Occurrence				Frost-Free Period (# of days last to first, 32ºF)
	24ºF	28ºF	32ºF	36ºF	24ºF	28ºF	32ºF	36ºF	
Applegate (1276 ft.)	NA[1]	NA	NA	NA	NA	NA	NA	NA	NA
Ashland (1750 ft.)	13-Mar	18-Apr	9-May	29-May	21-Nov	31-Oct	8-Oct	28-Sep	151
Cave Junction (1280 ft.)	24-Feb	13-Apr	8-May	30-May	12-Dec	2-Nov	12-Oct	19-Sep	157
Grants Pass (960 ft.)	22-Feb	2-Apr	30-Apr	20-May	6-Dec	5-Nov	12-Oct	24-Sep	161
Medford Airport (1300 ft.)	26-Feb	29-Mar	28-Apr	18-May	25-Nov	2-Nov	18-Oct	3-Oct	174
Medford AgriMet (1457 ft.)	7-Mar	1-Apr	14-May	8-Jun	13-Nov	19-Oct	3-Oct	17-Sep	142
Ruch (1549 ft.)	23-Mar	30-Apr	15-May	8-Jun	21-Nov	22-Oct	4-Oct	16-Sep	138
Williams (1450 ft.)	NA	NA	NA	NA	NA	NA	NA	NA	NA

Data Source: WRCC, 2003 (from the period of record for that station).

[1]NA = data not available.