

Climate, Microclimates, and Frost Dates

Gardeners, especially those new to our region, often ask about spring and fall frost dates and about our USDA zone. It's easy to say March 23rd, November 18th, and Zone 8, but that tells a gardener very little about our climate. For a good understanding, many factors need to be considered, including frost dates, minimum winter temperature, accumulated heat units, percentage of sunny days during the growing season, and, of course, precipitation.

Microclimate

General climate factors must be adjusted for a gardener's specific microclimate. The statistics given here are from Seattle, from the University of Washington where meteorological data has been recorded for over 75 years. However, Seattle's University District is warmer than most other places in King County.

Terrain and bodies of water play a big role in determining your microclimate. Cold air is denser than warm air and flows downhill. As air near the summit of a ridge or along a slope cools, it flows down the slope. The coldest air accumulates in valleys and lowlands. Gardens in low areas have a higher risk of late spring or early fall freezes.

North-facing areas receive less heat from the sun than areas with a southern exposure. The growth of plants may be delayed with a north exposure, and, therefore, the danger of injury by a late spring freeze may be reduced. Conversely, a warmer south slope may speed up plant development

and reduce the chance of injury from a fall freeze before the plants have matured.

Gardens near large bodies of water are less prone to frost and often a bit cooler on warmest days. Along Puget Sound, the moderating effect of the water extends inland over a large area.

In King County, moving inland from Puget Sound involves a gain in elevation. Higher gardens will usually be cooler and may also be wetter.

Frost Dates

The mean spring and fall frost dates are often used to show that Seattle has a 240-day growing season. For a few favored parts of Seattle, that figure is accurate. However, many areas are considerably cooler, and within relatively short distances, the growing season may vary by a month or more.

<u>Location</u>	<u>Last Frost</u>	<u>First Frost</u>
Seattle (UW)	March 23	Nov. 18
Vashon	April 5	Nov. 7
SeaTac	April 9	Nov. 2
Snoqualmie	May 6	Oct. 9
Bothell	May 13	Oct. 5

Keep in mind that frost dates are *mean* freeze dates. This means there is a 50% chance of a freeze on that date. It is not a guarantee, simply an assessment of probability. Gardening is a gamble, so

consider what you are risking. You might try planting seeds at less than \$2 a pack on the last frost date with hopes of getting a crop or flowers a week or two sooner. On the other hand, you won't want to endanger a favorite tuberous begonia or your tomato and pepper seedlings until the odds are better. At SeaTac, the probability of a spring freeze goes to 25% on April 23rd and to 10% on May 4th. Waiting until after Mother's Day to plant out tender plants is prudent in most King County locations.

Minimum Winter Temperatures

The USDA Plant Hardiness Zone designation is a measure of average annual minimum temperature. We are in Zone 8, which means that we can get down to 10° to 20°F in an average winter. By itself, that fact is nearly useless, considering that most of Louisiana is also in Zone 8, but it is helpful when combined with other data.

Accumulated Heat Units

Growing degree days, or accumulated heat units above a certain temperature, are measured to estimate the rate of growth and development of crops. The most frequently used base temperature is 50°F for warm-weather crops. Heat units are the difference between the mean temperature for the day and 50°F. (The day's mean temperature is found by adding the maximum and minimum temperatures and dividing the sum by 2.) If the mean temperature is below the base of 50°F, there are no heat units.

As an example, on a day when the maximum temperature is 72°F, and the minimum is 50°F, the mean temperature would be 61°F, and there would be 11 heat units added to the annual accumulation of heat units. The average annual accumulated heat units at some King County locations are:

Seattle (UW)	2156	Vashon	1725
Kent	1937	Snoqualmie	1613
SeaTac	1882	Bothell	1518

In comparison, Easter Washington sites may have a growing season of only 150 days (compared to 240 days for Seattle), but over 2,500 accumulated heat units.

Many plants require a certain number of accumulated heat units to grow well or to ripen fruit. Local gardens may not get enough heat to properly ripen certain varieties of tomatoes, peppers, grapes, etc. Plastic row covers, planting against a south-facing wall, and other techniques to build and retain heat are often practiced by determined gardeners.

Days of Sunshine

We have very low light intensity through most of the year. Cloudy or partly cloudy days are usual in fall, winter, and spring. Plants that can be grown in part shade in many other regions may need full sun exposure in King County gardens.

For example, with little sunshine, apples may not get very red, hot peppers may seem mild, peaches may not get very sweet, and the vitamin C content of tomatoes may not be as high.

Knowledge is Power

Consider all the factors that make our climate unique. Then learn how to use gardening techniques to maximize or minimize them. In this way, you'll maximize your gardening success