Microclimates

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Plants will thrive in the conditions they like best

According to the USDA Plant Hardiness Zone Map, areas within the Skagit Valley are either a zone 7a, 7b, or 8. But have you ever tried to grow something that you know is in the correct zone, but despite your efforts it dies anyway? The problem could be any number of reasons, but maybe it was in the wrong microclimate in your yard. Yes, your yard can have multiple microclimates.

Understanding microclimates is important, because your plants will thrive in the conditions, they like best. It seems simple enough: learn what the USDA zone is for your area, buy a plant for that zone and then watch it thrive in your yard.

However, many gardeners who bring their ailing plant to the Master Gardener Plant Clinic discover that once other factors are ruled out, the plant does not like where it has been planted despite being planted in the correct zone. When a plant struggles to survive, it is more susceptible to disease and pests.

Microclimates are shaped by a conglomerate of different influences. These include any combination of the following:

- The plant has been planted in the wrong climate zone.
- The soil is too wet or too dry.
- Air flow is too windy or nonexistent.
- The plant is on a hot, south-facing slope.
- Or it is at the bottom of a cold glen.
- The elevation is too high.
- It is too close to large bodies of water.

This is why Master Gardeners say put the right plant in the right place!

An area’s climate is based on data averaged over a long period of time (about 30 years). A microclimate is a local set of atmospheric conditions that differ from those in the surrounding areas—sometimes slightly, sometimes more substantially. The term may refer to areas as small as a few square feet in a garden bed or could be as large as a city lot or larger.

Soil can vary significantly from one area to another. Is it too wet? Does it have a lot of clay? Is it sandy, so the water runs right through it? Here in the PNW, we tend to think that much of our soil is clay-like when actually it may be compacted because of heavy equipment.

A moist, mostly shady microclimate is a perfect location for ferns and shade-loving plants to thrive. *Photo by Nancy Crowell / WSU Skagit County Extension Master Gardeners.*

Soil compaction and high-water table—puddles that don't dry up when the rest of the yard is dry mean that the drainage is poor. It's important to know about the drainage in your garden; any good gardening book will explain the procedures to check for this problem.

Determining soil temperature is important to find the hottest, or coldest, spots in your garden if you want to grow a plant that is slightly out of your USDA garden zone. Place a garden thermometer in the ground about 2 inches deep for at least 3 minutes. Do this in several different areas of your garden; you may be surprised where that hot spot may be found.

To discover where the most sun and shade is located, make a map of your garden three times on one day at 9 a.m., 12 p.m., and 3 p.m. at the beginning, middle and end of the growing season. This map will be a good indicator of where the shady plants will thrive and where the sun-loving plants will be happy. Also note any drainage problems, prevailing winds, protected spots, and problem areas.

In an urban area, tall buildings create their own microclimate, both by overshadowing large areas and by channeling strong winds to ground level. In the Discovery Garden, a semi-permeable windbreak filters the wind through it and slows it down. The turbulence, then, stays high above the garden plants. If the windbreak is too dense, the wind will be completely blocked causing increased turbulence on top of your plants just as it does around tall, narrow houses.

Also consider brick, concrete, and asphalt that absorb the sun's energy, heat up and re-radiate that heat to the ambient air resulting in yet another microclimate.

Another contributing factor of a microclimate is the slope or aspect of an area. In the northern hemisphere, south-facing aspects are exposed to more direct sunlight than opposite slopes. This leads to warmer temperatures for longer periods of time, giving the slope a warmer microclimate than the areas around it. This applies to any small slope you have in your own yard.

At the lowest spot in your yard, nighttime condensation may freeze, creating a "cold sink." Because cold air sinks, a drying breeze may not reach the lowest spot; humidity lingers and precipitates, then freezes.

Another phenomenon is called a "rain shadow" that occurs on the downhill side of a mountain where less rain falls. This applies to any small slope in your own yard, so a drier microclimate might even exist behind a larger rock.

Spring advances one day later for every 100 feet of elevation. This doesn't seem like much until you consider areas upriver like Concrete that has a wide range of elevation. This difference is even noticeable at the top of a slight grade. The neighbor down the hill probably has flowers blooming earlier than you do.

Proximity to water can also be a factor in creating a microclimate. Because of its moderating effect, the Pacific Ocean keeps the PNW in warmer zones than nearby inland areas.

A warmer microclimate can offer an opportunity as a small growing region for plants that won't survive in other areas of your yard. As a gardener you will succeed when you carefully choose and position your plants according to the microclimates that exist in your own yard.

A south-facing wall with full sun creates a perfect microclimate for this climbing rose to thrive. There are also two clematis growing on this wall. *Photo by Nancy Crowell / WSU Skagit County Extension Master Gardeners.*

RESOURCES:

- "Microclimate." Cornell Small Farms Program. Cornell University. 2019.
- "Microclimate in Forest Ecosystem and Landscape Ecology." USDA Forest Service. 2019.
- Camus, John. "6 Examples of an Urban Microclimate." Sotoga Sustainability Guide. Nov. 12, 2017.