

Heat Stress in the Garden

by Phyllis Pugnetti

Summer has arrived and so have garden problems related to heat stress. Heat stressed plants suffer from poor water absorption and nutrient deficiencies. Lawns turn yellow; leaves on shrubs and trees curl or develop brown tips; plants wilt. This is a time when many people self-diagnose problems in their gardens and often come up with the right answer, but the wrong solution.

Temperature is important when diagnosing many garden problems. All plants have a temperature range in which they survive, and an even narrower range where they thrive. If the temperature is too hot or too cold, it slows or even stops the process of osmosis which is how plants absorb water- and water-soluble nutrients. Heat stressed plants are more likely to die especially when other stressors are added into the mix. It helps to wait for cooler weather before pruning, applying fertilizer, pesticide, or herbicides regardless of whether they are organic or chemical.

Since gardeners tend to worry most about their tomatoes and lawns, we'll use both as examples. Tomato plants survive when temperatures are between 50° and 95° but thrive between 75° and 85°. This narrow range is ideal for efficient osmosis in tomatoes. They grow quite well, about 10° on either side of the ideal. The further from the ideal, the less efficient osmosis becomes, and gradually plants cannot take up water and nutrients which means they turn yellow, wilt, and eventually die. Adding more fertilizer and water will not help, and in fact can be detrimental.

The ideal temperature differs from plant to plant. Spring and fall weather is ideal for lawn. That's when it's lush, green, and growing so fast you need to mow more than once a week. Then as winter comes, the lawn gradually turns brown, stops growing, and looks dead. It simply cannot take up water- or water-soluble nutrients in cold weather. When the weather is too hot our lawns look yellow, showing signs of nitrogen, iron, or phosphorus deficiencies. Even though the soil has no deficiencies, the lawn cannot absorb the nutrients in hot or cold weather.

The most common problems caused by temperature

- Leaves that curl into a tube could be leaf curl virus if leaves are also small, deformed, and purplish. In the absence of any symptoms other than curling leaves, it is more likely to be heat stress. Many plants, including tomatoes have an adaptive trait of leaves curling to retain moisture and reflect excessive heat away from the plant. This happens most often in varieties that are specifically bred for cooler climates.
- A black spot on the blossom end of tomatoes is usually blossom end rot. It is caused by a calcium deficiency that is often caused when weather is too cold or hot for the plant to take up the calcium that is already in the soil. If this problem is chronic in your garden, have a soil test done to check for adequate calcium. Also planting varieties that are resistant to blossom rot will help.
- When tomatoes (and to a lesser degree peppers and eggplant) show signs of scarring and misshapen areas on the fruits it may be catfacing which is nearly always due to cold

weather, or sudden weather fluctuations. Waiting for better weather and planting varieties are less prone to catfacing will reduce the problem.

- Chlorosis causes yellow leaves with veins that remain green. This can be seen in vegetables and ornamentals and is commonly due to iron or phosphorus deficiency; but in Yakima, the most likely culprit is weather. Once the plant is in its comfort zone it will take up the needed nutrients to resolve the issue.

The good news

Yakima soil was created when volcanic eruptions ground the native rocks into fine ash, creating soil that has plenty of rock-based nutrients, like phosphorus, manganese, magnesium, iron, zinc, copper, and calcium. These are in a usable and stable form. They do not easily leach through the soil into water ways and are very slowly depleted. ***You should never add rock elements without a soil test to confirm a true deficiency!*** Too many of these elements will cause long-term problems that are difficult to resolve.

The best thing for heat stress is patience. Cooler weather will come, and your garden will grow again. Or, if possible, shade plants when temperatures are at their highest.

For any gardening questions - you are always welcome to contact our Master Gardener Clinic at 509-574-1604 or email gardener@co.yakima.wa.us.