

Weather affects plants in many obvious ways, but also in ways we may not realize. While a tree snapped by a gust of wind is easy to associate with the event, large trees may not show the effects of drought until several years later. In addition to any direct effects, weather-related stress can make plants more susceptible to disease and insect problems.

Weather is whatever is happening now - precipitation, temperature, wind, sun, and humidity. It is not the same as climate, which is historical weather or the average of weather conditions over a long period of time. Climate determines what will probably grow well in your area, but plants can still be damaged or killed by extreme weather.

While we have no control over the weather, in some cases we can try to design and maintain the garden to minimize the negative effects of weather on our plants.

Temperature

Generally, plants grow faster with increasing air temperatures up to a point. Extreme heat will slow growth and also increase moisture loss. The temperatures for optimal growth vary with the type of plant. Some annual flowers and vegetables are extremely sensitive to cold, and transplants should not be planted until temperatures are consistently warm.

Extremely hot or cold soil temperatures can also hamper plant growth, as well as affect seed germination.

Cool temperatures in fall trigger the plant to reduce growth and store energy. As temperatures approach freezing, growth stops and the plant (if perennial) becomes dormant. Plants are better able to withstand cold temperatures when dormant. A sudden cold snap in late fall before the plant has had a chance to harden off can do more harm than sustained cold temperatures in mid-winter.

Many plants require a chilling period of a certain number of days before growth resumes in spring. Plants native to areas further south with a shorter chilling requirement may resume growth during a warm period in winter and then be damaged when cold weather returns. Plants native to the area will generally not break dormancy.

Wide temperature fluctuations can be hard on plants, particularly in winter. Warm days followed by freezing nights can cause bark injury on trees with thin, smooth bark. Alternate freezing and thawing of soil can result in heaving of shallow-rooted plants.

Temperature (along with day length in some cases) can also trigger flowering in some plants, as well as affect how long flowers last.

Extreme temperatures (too hot or too cold) can inhibit fruit set on tomatoes and other garden plants. Temperature as well as moisture level may affect the flavor of fruits and vegetables. Hot weather can cause cool-season vegetables to bolt, resulting in reduced production and changes in flavor.

An unexpected frost can cause special problems in spring or fall. Frost can damage cell walls or cell contents of actively growing plants. Frost is more likely in low-lying areas on a clear night with little wind. An early fall frost can be followed by a number of weeks of warm weather.

Temperature can also have indirect effects on plants. A warm winter may result in a larger insect population the following season.

Precipitation

Precipitation comes in many forms - rain, snow, sleet, hail, and ice. The water available to plants for growth is affected by the amount and type of precipitation, as well as soil characteristics, temperature, and wind. The effects of too much or too little precipitation can be temporary or permanent, de-

pending on the type of plant and how long the condition lasts.

Water is necessary for virtually every function of plant growth. Lack of water damages plant cells, resulting in decreased growth, wilting, and leaf scorch, and eventually leaf drop and root damage.

Too much water reduces the amount of oxygen in the soil, resulting in root loss or injury. It can also make the plant more susceptible to many fungal diseases.

Heavy rain can damage plants, compact soil, and cause erosion.

Snow, in addition to providing moisture, can also insulate and protect plants from temperature extremes and fluctuations. However, the weight of heavy snow can break branches (especially on evergreens). Snow cover can also make it more difficult for wildlife to find food and result in more damage to landscape plants. Ice and hail, as well as de-icing salts, can all cause damage to plants.

Humidity refers to the amount of moisture in the air, and may or may not be associated with precipitation. High humidity reduces water loss from plants, and may increase the chance of disease.

Wind

Wind has a drying effect. This can dry out wet plants, reducing disease chances. However, it can also remove water faster than the plant can replace it. This can be a problem in summer when combined with high temperatures and low soil moisture. It can also be a special problem for evergreens in winter since they continue to lose moisture through their leaves or needles and are unable to replace it if the ground is frozen.

Wind can disperse pollen, seeds, spores, insects, pathogens, salt, and noxious chemicals. Excess wind can do considerable damage to plants.

Minimizing Harmful Weather Effects

- Choose plants that are well-suited to your climate and growing conditions. Native plants are usually well-adapted to local conditions.
- Take care when choosing trees. Tree varieties with weak wood or structure are more prone to wind and storm damage.
- Keep plants healthy. Healthy plants are better able to deal with stress of all kinds.
- Try to maintain an even moisture level. Water as needed and mulch. Improve soil to help retain moisture.
- If possible, provide water for large trees during extended drought.
- Make sure evergreens are well watered in fall before ground freezes.
- Mulch perennials and wrap young trees to protect from fluctuating winter temperatures.
- Use care when removing snow from plants. It's usually best to just leave ice-covered plants alone.
- Don't plow or shovel snow that might contain de-icing salts onto plants.
- Know your first and last average frost dates and be prepared to protect plants. Cover plants with fabric to protect from frost. Moist soil will also provide extra protection.
- If you live in an extremely windy location, you might want to consider planting a windbreak.

Just remember, no matter how well you plan, Mother Nature is in charge. All you can do is stay aware of weather conditions and try to protect plants as best you can. And if the worst happens, you have a chance to plan a whole new garden!

For more information on gardening please visit:

<http://web.extension.illinois.edu/state/programarea.cfm?ProgramAreaID=14>

or

call University of Illinois Extension
Knox County Office
309-342-5108

Other information brochures can be found online at <http://web.extension.illinois.edu/hkmw/hort.html>

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How Weather Affects Plants



Garden Tips

from
Knox County
Master Gardeners



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