Frosts, Freezes, and Hard Freezes

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Last month, the nighttime temperature was officially registered at 28^{oF} (my south Texas thermometer doesn't go below 50°). When the temperature gets this cold, the weather forecasters spoke of the "Three P's": plants, pets, and pipes. How does this coldest weather affect plants and at what temperature do I need to do something about my plants?

The first thing is to know your plants. Some plants are *cold sensitive;* they can only handle the cold to a certain temperature, which may still be above freezing. These plants often are native to more tropical regions and therefore are susceptible to chilling injury here in Bexar County. Coleus, croton, and many bedding plants are in this group.

Then there is the *cold tolerance* of a plant. John Einset, of the Arnold Arboretum and Professor of Biology at Harvard writes, "Cold-tolerance depends upon a plant's ability to keep water from leaving its cells and freezing, which severely dehydrates the cells." Thus, many of our native and well-adapted plants can suffer damage when we have a frost or freeze.

Frosts - Frosts can happen even if the air temperature doesn't reach freezing. When the air temperature is close to freezing, the surface area on a plant's leaf can fall below freezing, allowing the water crystals in the air to freeze or "frost." Frost happens when the air at night is still and the air's temperatures are close to freezing.

Freezes - Freezes happen when the air temperature drops below 32^{oF} towards morning but rises quickly when the sun rises. A freeze will kill plants, but we can do things to protect our plants.

Hard Freeze - A hard freeze will occur when the temperature drops below freezing for an extended length of time. With a hard freeze, there is little that can be done to protect cold sensitive plants.

The science of freeze damage is fascinating. When the water inside the plant freezes, it forms crystals which puncture the walls of the plant's cells. When the temperatures rise, the water leaks out through the punctures and the plant cell dies.

What can we do to protect our plants?

One thing we can do is to water our plants because water acts as a "heat sink."

Another possibility is to cover the plants… but how and with what? Plastic is not the best because it allows for quick radiational heating. The heat from the ground provides some protection if you drape a cloth over the plant and anchor at the bottom to help keep heat in. I covered this porterweed with a hanging basket wrapped with Insulate and covered the edges with mulch.

A gallon jug of water set next to a plant under the cover will add a little more heat since water holds heat.

If it's going to be a light freeze, those holiday lights we just took down can be put around the plants.

The use of mulch around perennials will help protect the root system. Try to maintain your mulch at two inches deep.

Container plants can be brought near or inside a building or under some covering. The covering traps heat.

Other things we can do: Know the plants in your landscape; know the cold hardiness of the plants; and know which ones are cold sensitive. Put the more sensitive plants in pots that can easily be moved to some kind of shelter when the temperatures get extremely cold.

Watch the weather carefully and take appropriate measures. Spring is only a month away!

This information was taken from these articles:
https://aggie-horticulture.tamu.edu/travis/wp-content/uploads/2013/06/FrostsandFreezes.pdf
https://today.tamu.edu/2019/11/11/how-to-prepare-your-plants-for-cold-weather/
And why some plants are cold sensitive, and others are not:
https://www.biologydiscussion.com/plant-physiology-2/stress-physiology/cold-injury-and-cold-resistance-in-plants/23650