How to Prevent and Treat Frost Damage

What Causes Frost Damage?

Damage is caused by exposure to low temperatures near or below freezing. Here are a few factors that can increase the likelihood and severity of plant damage. These include:

Temperature:
Frost damage occurs when temperatures drop below freezing (0°C or 32°F). The severity of the damage depends on how long the temperature stays below freezing and how low the temperature drops.

Moisture:
When there is a high level of moisture in the air or on the surface of plants or other materials, it can increase the likelihood of frost damage. This is because moisture freezes at a higher temperature than dry air.

Wind:
Wind can exacerbate frost damage by causing water to evaporate more quickly from the surface of plants or other materials, leading to faster cooling and freezing. When assesing the risk of frost damage, remember it is not just the temperature, but also the wind conditions that are important, some weather channels call this the 'real feel' temperature.

Location:
Certain locations are more prone to frost damage than others. For example, low-lying areas or areas with poor drainage are more likely to experience frost damage because cold air tends to settle in these areas.

Plant type:
Different plants have varying levels of tolerance to freezing temperatures. Some are more vulnerable to frost damage than others.

What are the Symptoms?

The symptoms of frost damage can vary depending on the severity of the exposure and the type of plant or material that is affected. Some common symptoms in plants include:

- Wilting or drooping leaves
- Soft or mushy tissue when touched
- Defoliation or leaf drop
- Stunted growth or distorted leaves

- Brown or black patches on leaves, fruits or flowers
- Split bark on the stems or trunks of woody plants

It is important to note that some symptoms of frost damage may not appear immediately after exposure to freezing temperatures. In some cases, it may take several days for the symptoms to become visible. Additionally, some plants may be able to recover from mild damage, while others may suffer irreversible damage.

Preventing and treating frost damage can involve several measures, depending on the severity of the exposure and the type of plant or material affected. Here are some steps that can be taken to prevent and treat it:

Preventing Frost Damage

Monitor weather conditions:
Stay informed about the weather forecast and take measures to protect plants or materials when temperatures are expected to drop below freezing.

Move your container-grown plants:
Container grown plants are more susceptible to frost damage than plants grown in the ground. Move your containers to a protected location. Covering the plants with frost blankets or other protective coverings can provide additional insulation and help to prevent frost damage. Ensure that the coverings extend all the way to the ground and are secured tightly to prevent cold air from entering.

Tender plants:
Tender plants are plants that might not be hardy in our planting zone (listed as zone 8b or 9a). If lifting or moving these tender plants to a more sheltered location or cold frame is not feasible, another option to protect them from frost damage is to wrap them. This can help to insulate the plants and prevent the cold from damaging them. Some examples of plants that can be wrapped include bananas, tree ferns, Ti plants. Tomato cages placed over the plants in fall (or left in place year-round?) make wrapping easier.

Know your plants:
Research your plants! Not all tropical plants are as cold-sensitive as you might expect. Some tropical plants can take cold temperatures (down to freezing) in their stride! My Rex begonies, Philodendron, Clivia and Bird of Paradies surprise me in this regard.

Know ***when*** you planted your plants. Established plants can tolerate lower temperatures much better than those you just planted this fall. Protect them accordinlgy!

Cover your plants:
Covering plants with blankets, tarps, or other materials can help protect them from the damage. Ensure that the covers extend to the ground and are secured tightly to prevent cold air from entering. Don't forget to uncover your plant during the day!

Frost pockets:
Frost pockets are areas in a landscape or garden where cold air can collect and become trapped, resulting in colder temperatures that can cause frost damage to plants. My garden has warmer and colder spots. Plants do better in areas where they are closer to the house (which radiateds heat

during cold nights and protects from winds) or protected by trees or bushes. During the winter, the coldest spots in a garden are often found on the north and northwest parts of the property and in low areas where cold air settles. The warmest spots are usually on the southern part of the property. Plant you tropical and frost sensitive plants accordingly; closer to the house and/or with southern exposure. Realize that plants located in flat or low lying areas need extra protection from the cold. Know your garden's microclimate and know your frostpockets!

Apply mulch:

Mulch can be an effective way to prevent or reduce the damage in plants. It helps to insulate the soil, reducing the rate of heat loss and preventing the soil from freezing. This can help to protect the roots of plants and allow them to continue growing and developing, even during periods of cold weather. Apply a layer of organic mulch around the base of the plant, taking care to avoid the stems and leaves. The layer of mulch should be around 2 to 3 inches thick and should cover the entire root zone. Some materials that can be used for mulch include straw, leaves, wood chips, and shredded bark.

Be aware that there are some plants you should NOT mulch. Irises should not be mulched and should have their rizomes exposed in the south. Peonies should be planted in morning sun with their pink buds just above the soil. Similarly for hardy bulbs. These all need a period of cold (chill hours) to produce better flowers, in the South.

Fertilizers:

A lot of scientific research has been performed more recently on nutrients and their effect on cold (and heat) tolerance of plants.

- The use of ***Nitrogen***-rich fertilizers on plants that are at risk of frost damage can actually increase the risk of damage. This is because nitrogen-rich fertilizers can promote new growth, which is often more vulnerable to frost damage than older growth. Avoid applying nitrogen-rich fertilizers late in the season.
- Conversely ***Potasium*** (Muriate of Potash) increase resistance to drought or extreme cold. Potassium deficiency is more common on light, sandy soils and signs include brown scorching and curling of leaf tips.
- ***Magnesium*** (Epsom salt) promotes root growth and can therefore help ensure that plants can still absorb water from deeper soil layers via a well-developed root system, even when the soil is slightly frozen.

Always contact your local extension office (Clemson) before making any drastic changes in your fertilization regimen!

Treating Frost Damage

If your plants have already suffered from frost damage, here are some steps you can take to treat them:

Assess the damage:

Take a close look at the plants to determine the extent of the damage. If only the leaves or tips of the plant are affected, the plant may recover. If the damage is more severe, such as blackened stems or a completely wilted plant, it may not be salvageable.

Remove damaged leaves or stems:

Remove mushy leaves to prevent disease. Use clean, sharp scissors or pruners to make clean cuts.

Provide additional protection:

If the plant is still at risk of further frost damage, provide additional protection by covering it with frost cloths or moving it to a protected location.

By taking these steps, it is possible to treat frost-damaged plants and help them recover from the effects of freezing temperatures.

Be patient:

The hardest thing to do! It may take some time for the plant to recover from frost damage. Be patient & wait. Last Spring (after 20' temps) I thought my Chinese fan palms were done for. The leaves has brown tips and were unsightly. I cut some of the leaves back. I should have resisted the urge to do so. The plants that I did not cut back eventually produced fresh new growth. The plants that I cut back severely did not survive. Ecergreen plants need their leaves for photosynthesis over the winter!

Summary

Remember, ***prevention*** is key when it comes to protecting plants from frost damage, and taking proactive measures before a freeze can help to minimize the risk of damage in the first place. You *can* take measures to protect plants during sudden and prolonged exposure to cold temperatures.

Reference: http://extension.msstate.edu/publications/protecting-plants-cold-temperatures