Cold Damage

Cold weather can cause all types of problems for plants in South Carolina. Freezing temperatures can damage plants by rupturing plant cells as ice crystals form and rapid changes in temperatures occur. Evergreen plants can suffer damage from blowing winter winds and dry out when water is unavailable from ground that is frozen in the colder regions of the state. Chilling injury can occur to many tropical plants although temperatures do not drop below 32 °F.

Some Causes of Cold Damage

Lack of Hardiness: Some plants are not completely hardy to an area. Use plant hardiness zone maps to help in selecting plants for particular locations.

Early or Late-Season Frosts: Early frosts in the fall can cause damage on plants that are normally adapted to an area. Plants need adequate time to harden off (adjust to outdoor conditions) before freezing temperatures occur. New growth that has been stimulated by late summer pruning or fertilization is very susceptible.

Plants can also be damaged when unseasonably warm weather during winter or early spring stimulates the production of new growth. Cold snaps can be very damaging to this tender foliage.

Unprotected Root Systems: Root systems that are unprotected above the ground are very susceptible to cold damage. This is especially true for plants in containers, planters or balled and burlapped plants. On some otherwise hardy species, lethal root temperatures can begin at 28 °F.

Types of Damage

Low Temperatures: The signs of cold damage can be confusing, since some damage may not be evident until months later. Leaves and tender shoots subjected to freezing temperatures or chilling damage appear water-soaked and wilted. These tissues will usually turn black within a few hours or days. The tips of narrow-leaved evergreens, such as junipers, may turn uniformly brown. Broad-leaved evergreens, such as hollies, often have marginal leaf burn. Reduced flowering is common during the following season.

Bark Splitting: This type of damage occurs as a splitting of the stem or bark, typically near the base of the plant due to sudden changes in temperature. If damage occurs at the crown (base) of the plant it may not survive.

Unseasonably warm weather during winter or early spring can cause plants to come out of dormancy. If a hard frost then occurs, this type of freeze damage is common, especially on azaleas. This problem also can exist in the fall when an early frost occurs before plants have stopped growing and properly acclimated to cold weather. Split stems and branches should be pruned to unaffected growth.

Frost Cracks: A frost crack is a long, deep, narrow crack running up and down the trunk of a tree. The crack is usually on the south or southwest side of the trunk, but can occur on any side. Young trees or older trees with smooth bark are the most susceptible.
Frost cracks occur when the sun warms the trunk in the winter, causing tissues to rapidly expand or when clouds or buildings block the sun. At sunset the temperature of the trunk drops quickly to that of the surrounding air, and the trunk contracts. The outer part of the trunk cools and contracts faster than the inner tissues. This difference in contraction rates can cause the outer trunk to crack.

Protect tree trunks by wrapping them with paper tree wrap or burlap to prevent frost cracks. The wrap should start at the ground level and go all the way up to the first main branches. Fruit trees are sometimes painted with white latex paint, which reflects sunlight and keeps the trunk from cracking. Prevention is important, since once the crack occurs, nothing can be done.

Desiccation: Desiccation, or drying out, is a particular problem on evergreen plants. This occurs when water is leaving the plant faster than it is being taken into the plant. During the winter months desiccation can occur if the ground is frozen beyond the depth of the root system. If the fall has been dry, there may not be enough ground moisture available for the plant. Water loss is greatest during windy, sunny conditions. This type of injury appears as discolored or burned evergreen needles or leaves.

Care of Plants after a Freeze
Do not be in a hurry to prune or remove your damaged plants. Some plants may appear dead, but they are not. Corrective pruning should not be started until the full extent of the damage can be determined.

Injury to foliage and tender shoots should be visible within a few days, but it may be several months before damage to larger limbs can be determined. Wait to see if any live green foliage reappears or gently scrap under the outer layer of bark to see if green wood is present.

Once you have determined the extent of damage, remove any dead wood. There is very little that can be done to revive plants suffering from the extreme effects of freezing. Watering cold-damaged plants that appear wilted will not help to revive them.

Avoiding Winter Damage
The best way to avoid winter damage is to select appropriately hardy plants. Use plant hardiness zone maps to select plants for particular locations. Within a hardiness zone, consider using only plants adapted to a lower number if your planting site has particularly harsh conditions.

Allow plants to harden in the fall before cold weather begins. Do not stimulate new growth by applying excessive nitrogen or pruning in early autumn. Plants that are diseased or deficient in nutrients are more susceptible to winter injury than healthy ones. Corrective measures should be taken in time so they won’t affect cold acclimation.

Water plants during late summer and autumn to prevent them from entering the winter under drought stress. Drought predisposes plants to winter injury and cankers.

Avoid low spots that can create frost pockets and sites that can have rapid changes in temperatures. Flowers and leaf buds can be damaged when they are prematurely stimulated to open by warm days, and then subjected to freezing temperatures at night.

Pack potted plants close together and cover them with a translucent plastic sheet that does not touch plants. Mulch or mound soil around pots and balled and burlapped plants to insulate the roots.

Protect plants in exposed locations by wrapping burlap or building a lathe structure around them.

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