

# The Plant Doctor

## *Cold Injury*



Winter's cold injuries can lead to future plant problems. Many garden plants will be paying the costs of this winter's cold weather for months or even years to come. Problems may appear at any time, from June through September and even in next year's spring. Wilting leaves or thinning canopy may be seen in the summer's heat. These symptoms may have been caused by last winter's hardships. A plant that doesn't emerge from dormancy in spring may have received the fatal injury last winter.

Unlike animals that escape to safety when temperatures drop, plants withstand whatever comes their way. They prepare for colder temperatures by reducing the amount of free water in their water- (xylem) and food- (phloem) carrying vessels.

If plants don't reduce the amount of free water, ice forms between the plant's cells. The ice draws water from the cells themselves, causing the cells to weaken or collapse.

Injured phloem will carry fewer nutrients to the roots, stunting root growth. Injured xylem will carry less water to the branches and leaves. Both of these problems limit the supply of vitally needed water and salts to the leaves.

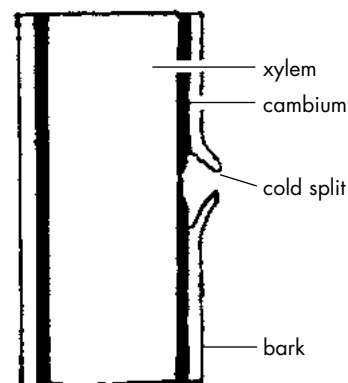
Plants that had little time to prepare for cold temperatures will be more severely injured than those that cooled more slowly. Plants that formed tender leaves in response to late prunings or a fall application of nitrogen are particularly susceptible to cold damage, as are plants that have been under stress, such as drought.

Weakened plants may seem to emerge from dormancy and flower just fine. Those buds were formed last year, and the plant set aside necessary nutrients. Once the plant uses up those resources, symptoms may appear.

Symptoms of cold damage may be worse in hot summer weather. Foliage needs extra water during hot weather to help keep the plant cool. In a cold-injured plant, not enough water and nutrients can make it past the injured areas to replace this water. Such damage may appear in branches here and there.

You may see signs of cold damage in almost any plant part. Roots, especially young feeder roots, may be discolored and rot away. Twigs, branches, or the trunk may have split bark, separation of the bark from the cambium, and even sun scalding. Leaves or needles may show tip burn. Fruit may shrink.

The most serious kind of freeze damage is cambial browning. The cambium layer is immediately under the bark, between the woody xylem on the inside and the phloem towards the outside. It brings about continued plant growth. If a look inside a cold split or an exploratory bark peel reveals browning, or worse, a sour smell, the plant is seriously damaged and will likely not live.



Side cutaway view of a stem, branch, or trunk showing a cold split and the xylem, cambium, and bark layers.

Take some time now to check your garden's health. You may need to nurse some plants to better health. First and foremost, you must protect plants from further stress. This means proper watering, fertilization, and pruning.

Provide enough moisture through the dry periods of the year. If leaves show signs of wilting in summer's heat despite adequate soil moisture, misting the foliage will help. Make sure you do not over water the plant. Over watering will keep air from reaching the roots and suffocate them, stressing the plant even more.

Check for cold damage this spring as you clean your garden. Examine trunks, branches, and limbs for cold cracks. Remove affected branches and limbs. You can't do anything for split trunks.

Prune dead wood back to healthy areas once leafing has occurred. This will not only improve the looks of the plant but keep out insects and diseases.

Fertilize the plants with a slow release fertilizer in holes drilled into the soil around the drip line. Do not use a quick release high nitrogen fertilizer. Consult your Extension agent for recommended fertilizers for your area.

Diagnosing winter damage is very difficult in July or August because the injury occurred so long in the past and signs of cold injury maybe difficult to detect.

Be aware of cold damage, but don't blame everything on it. The damage may well be from another source, such as an herbicide or fertilizer burn.

---

Information Sheet 1663 (POD-05-19)

By **Alan Henn**, PhD, Extension Professor, Biochemistry, Molecular Biology, Entomology and Plant Pathology.



*Copyright 2019 by Mississippi State University. All rights reserved. This publication may be copied and distributed without alteration for nonprofit educational purposes provided that credit is given to the Mississippi State University Extension Service.*

Produced by Agricultural Communications.

Mississippi State University is an equal opportunity institution. Discrimination in university employment, programs, or activities based on race, color, ethnicity, sex, pregnancy, religion, national origin, disability, age, sexual orientation, genetic information, status as a U.S. veteran, or any other status protected by applicable law is prohibited. Questions about equal opportunity programs or compliance should be directed to the Office of Compliance and Integrity, 56 Morgan Avenue, P.O. 6044, Mississippi State, MS 39762, (662) 325-5839.

Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director