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EC81-1869 Guide to the Identification of Physiological Disorders of Landscape Plants

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HOME GARDEN AND LANDSCAPE DISEASE SERIES

Guide to the Identification of Physiological Disorders of Landscape Plants

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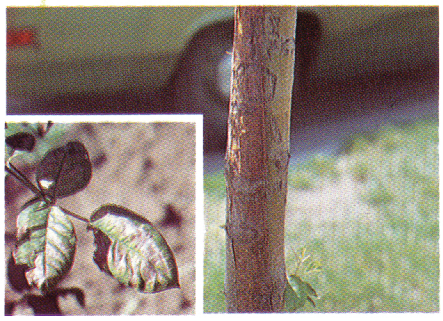


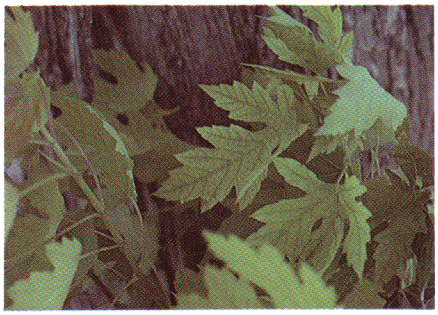
1. Sun Scald—Crabapple
Insert—Rose

2. Drought—Dogwood

3. Lightning Injury

4. Winter Injury—Taxus

5. Root Girdling



6. Iron Chlorosis—Pin Oak

7. Salt Injury—Taxus

8. Herbicide Injury—Viburnum

9. Air Pollution—Mugho Pine

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Guide to the Identification of Physiological Disorders of Landscape Plants

Introduction

Physiological disorders are plant diseases caused by non-living agents. Other terms for this group of disorders are abiotic diseases or noninfectious diseases.

Physiological disorders are often confused with pathogen-caused diseases but they do not spread from plant to plant as do diseases caused by living organisms. Landscape plants are often exposed to toxic materials, mechanical damage, nutritional stress, homeowner neglect and other stress factors in the urban environment. Affected plants may decline slowly or die rapidly depending upon the nature and severity of the stress or injury. In general, symptoms of physiological disorders are more uniform on the affected plant than the random pattern produced by plant pathogens.

Symptoms

1. Sun Scald. This condition can occur during the winter or summer. The long, narrow canker on the trunk of the crabapple in Figure 1 typifies symptoms of winter sun scald. Bark on the southwest side of the trunk of young trees is exposed to intense winter sun which produces an increase in temperature on the trunk's surface. This change in temperature causes the bark to split. It is important to protect smooth bark species or new transplants by wrapping the trunk up to the branches with burlap or a commercial tree wrap paper. Keep trees wrapped for at least two years, replacing damaged wrap when necessary. Remove the wrap for short periods in summer to allow the bark to dry.

Summer sun scald, as seen on the rose leaves in the insert, occurs when plants accustomed to shade conditions are planted in exposed sites. Upper leaf surfaces take on a shiny gray sheen and become brittle. Careful planting site selection and a knowledge of optimum growth requirements prevent excessive damage from sun scorch.

2. Drought. Young or newly transplanted trees and shrubs exposed to hot, drying winds will lose water through the leaves faster than the roots can take it up from the soil. Under these conditions, plants will show browning of the leaf margins or tips. Extended drought may cause premature leaf loss. Protect new plantings from wind or locate where excessive wind movement will not create stress. Plantings under overhangs, in sandy soils or on steep slopes must be watered regularly during the year of transplanting. Mulches such as wood chips, saw dust, or bark on the soil over the roots reduce competition from weeds, retard evaporation and conserve soil moisture.

3. Lightning Injury. During summer storms lightning may strike shade trees causing damage. The bark can be shattered and split in a band usually from the point of entry to the ground. Little can be done to prevent injury from natural causes, but when these occur measures must be promptly taken to deal with the aftermath. If the injured area is small, use a chisel to remove injured wood, extending the cut 2 inches (5.1 cm) into healthy tissue. The value of applying a wound dressing is questionable and should be the decision of the tree's owner. When extensive injury has occurred, consider removing the tree.

4. Winter Injury. Dry winds and prolonged periods of near-zero temperatures in the winter months can scorch evergreen foliage. Plants entering the winter without adequate soil moisture or low food reserves, or plants with succulent growth due to over stimulation by late summer fertilization are susceptible to low temperature injury. To avoid low temperature injury, plant hardy varieties and maintain plants in the best possible vigor going into winter.

Winter injury through desiccation occurs when dry, winter winds take away moisture from the foliage at a time when the root system is unable to take moisture from the frozen soil to replenish that lost by the leaves. Japanese yews, arborvitae, boxwood, holly, azalea, rhododendron and some species of enonymus should be planted in a site protected from north and west winds or wrapped in canvas or burlap.

5. Root Girdling. Plants that have been adequately watered but show symptoms of scorch may suffer from girdling roots. Girdling roots may occur at ground level or below. As plants age, roots wrapped tightly around the main trunk or other main roots enlarge and restrict the movement of moisture and nutrients to other roots and upper portion of the plant. Trees or shrubs literally strangle themselves to death. A tree that has no broadening at the base and rises straight up from the ground or is slightly concave on one side can be suspect of being injured by girdling roots. Early fall coloration is indicative of root girdling. Do not crowd bare root stock into a small hole. For older container-grown material, prune the root system lengthwise on two or three sides at planting.

6. Iron Chlorosis. Plants such as pin oak show symptoms of iron chlorosis when soil pH levels exceed 6.5. Chlorotic plants show partial green or complete yellowing of the leaves while the veins remain green. In severe cases leaves brown from the margins until they are totally brown, then drop from the tree. Tree death may result if chlorosis is not corrected. Changing the soil pH is difficult. Temporary correction can be provided by spraying the foliage or injecting the trunk with slow-release chelated compounds. The slowest response but most long-lasting control is usually obtained by applying iron sulfate, ammonium sulfate and sulfur to the soil. The element must be placed at regular intervals near the active root system.

7. Salt Injury. De-icing chemicals containing sodium chloride or calcium chloride used to clear sidewalks, driveways, and streets in winter will burn foliage when in contact with it. These chemicals cause a salt-induced desiccation similar to that caused by drying winter winds. Injury is toward the street side of the plant with plants farthest away from the street showing the least injury. The use of barriers adjacent to the street or deciduous shrubs more tolerant of salt help reduce this type of damage.

8. Herbicide Injury. Improperly used pesticides around the home can severely damage trees and shrubs. Volatile formulations of certain pesticides or pesticides taken up by the roots can result in chemical injury. Typical symptoms are distorted leaves and abnormal growth. Use pesticides around the home wisely and in strict compliance with label directions and precaution statements.

9. Air Pollution. Toxic gasses associated with electric power plants, automobiles and various industrial operations induce long-lasting injury to plants. Because of the airborne nature of these pollutants, damage may occur some distance from the source. Symptoms and the extent of injury depend upon the type of pollutant and the susceptibility of the plant. Sulfur dioxide often results in a tip burn of evergreen needles, a yellow necrotic banding on the needles, and an interveinal browning or necrosis or chlorosis of broadleaf plants. Fluorides also cause a tip burn of evergreen needles and margin necrosis on deciduous plants. Ozone and perocyacetylnitrate (PAN) cause a mottled and stippled pattern or a reddish-purple flecking on the upper leaf surface. Identification of the sources of pollutants and the installation of pollution control devices to stop the source are the only effective controls.

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Leo E. Lucas, Director

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