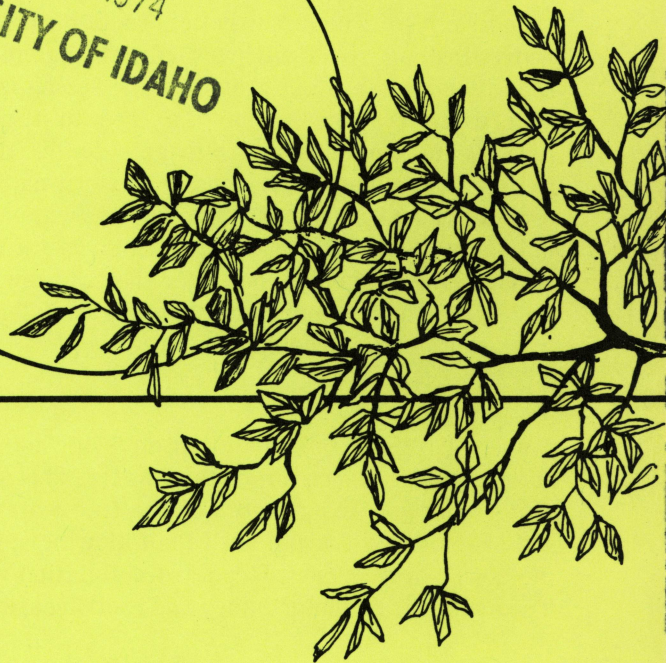




University of Idaho
College of Agriculture
Cooperative Extension Service
Agricultural Experiment Station

Leaf Scorch of Broad-Leaf SHADE TREES

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Leaf scorch is a common disorder of shade trees in Idaho. It occurs in all areas of the state but is most common in the arid areas of southern Idaho.

Symptoms

Leaves affected by leaf scorch become lightly discolored in irregular areas, usually starting at the margins. They will appear dry and scorched with dead areas extending along the leaf margins and between the small veins. As the condition progresses, much of the interveinal tissues dry up and first affected areas begin to drop out, leaving a tattered effect. These leaves may drop, but not always. Leaf scorch sometimes develops so rapidly that the leaves suddenly wilt, retaining a pale green color. These leaves invariably fall off the tree.

Frequently only one side of the tree is affected. This is generally on the side of the tree exposed to the sun or to drying winds, or on the side where the soil dries rapidly.

Trees located southwest of white structures often are affected more seriously than trees standing in the open. This is because the sun's reflection from the white structure to the tree foliage intensifies the heat to which the trees are exposed.

Trees at southwest sites adjacent to brick structures also suffer extensive damage. Heat is absorbed by the bricks during the day and released at night, thus maintaining intense heat near the foliage over a longer period of time.

Occasionally individual trees will be seriously damaged, while trees of the same species in the immediate vicinity will be unaffected.

Causes

Leaf scorch results when the tree fails to supply enough water to the leaves at a critical time. Many factors can affect uptake and movement of water in trees and thus influence the degree of leaf scorch. Some of them are discussed here.

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Low Soil Moisture in Early Spring

This situation occurs mostly in southern Idaho where dry fall, winter and spring conditions are common. Trees in winter are in a dormant stage and have low moisture requirements. In the early spring when the trees are breaking dormancy, drying winds prevail for several weeks. Although the demand for water by the trees is still low, new roots are initiated. The amount of feeder root production and growth at this time depends to a large extent on the availability of moisture and nutrients in the soil.

Contrary to a common belief, roots do not seek out water. Instead, roots will grow only when ample water is readily available. Root growth in the spring is essential to provide the means for the tree to take up and translocate moisture and nutrients to the developing foliage. When water is limited at this critical time, root production and growth are reduced, less water and fewer nutrients are taken up and translocated upward. As early as late May or early June, after the first few hot days, the leaves may exhibit the symptoms of leaf scorch. Partial or complete defoliation may result.

When they see this condition develop, home owners naturally apply large amounts of water. This stimulates root production and growth and the tree leafs out again and seems to be normal until the following spring when the condition reoccurs. Repeated defoliation weakens a tree and leads to winter injury and root diseases.

Prevention: After autumn leaf fall but before winter, fill the soil profile with water. This provides ample water for early spring root production and growth. In the spring, as the tree is breaking dormancy, water again to overcome evaporation caused by the drying winds.

Low Soil Moisture in Early Summer

Each July and August, leaf scorch and partial or complete defoliation of trees are reported throughout Idaho. The condition invariably can be traced back to an insufficient watering in May or June. An immense quantity of water is evaporated from tree leaf surfaces during hot dry weather. If water supply is deficient for any reason, the exposed leaves actually dry out.

Prevention: Water applied by sprinklers for the lawn often is not enough to meet tree needs. Soak the soil around the trees at regular intervals throughout the summer. We seldom observe leaf scorch in shade trees when flood irrigation is practiced.

Low Moisture Caused by Tree Location

Trees growing in poor locations may have a hard time getting enough water to supply their needs even with frequent irrigations or rains. Trees grow under adverse conditions in a city. They may have a street on one side, a sidewalk on another, a driveway on another and little or no open ground within many feet of the trunk. These trees often are the first to show leaf scorch. The leaves of some city trees scorch very badly year after year but by some whim of nature the trees survive.

Addition or removal of soil around a tree may result in leaf scorch. Adding soil reduces aeration of the feeder roots. Water has to percolate more deeply to supply the roots with ample moisture. Removing soil from around a tree may injure the feeder roots that support the crown. Shallow-rooted trees such as birch and ash are particularly subject to leaf scorch when the soil in the root zone has been disturbed.

Trees often are planted in deep sandy or gravelly soils. Such sites have excessive water drainage and the feeder roots may be subjected to frequent drought conditions.

Prevention: The home owner might need to prune some of the branches of poorly located trees to maintain a balance between the top and roots. If done carefully, pruning will not injure the appearance of the tree and may actually improve it.

Add soil around the base of a tree with care. An additional inch or two likely would not impair root growth, but if you plan to add several inches of soil, add it gradually over a period of years. Provide ample aeration and additional water.

Give more frequent watering and feeding to trees growing in soils that drain excessively. Do not add nutrients after midsummer.

Excess or Deficient Nitrogen

Inexperienced gardeners often apply too much commercial fertilizer, particularly high nitrogen fertilizer, to young or recently transplanted trees. Nitrogen stimulates top growth. Excessive top growth may require more water than can be absorbed and translocated to the leaves. Excess nutrients during the late summer delay normal ripening of the tree before leaf fall. This predisposes the tree to winter injury.

A deficiency of nutrients keeps the tree in an unthrifty condition. It reduces root production and growth and subsequent top growth. Such trees also suffer more from drought and winter injury.

Prevention: Idaho is so diverse in climate, elevation and soils that no single fertility program will fulfill tree requirements in all areas of the state. Consult your county agricultural extension agent for tree fertility recommendations for your area.

Insects and Root Diseases

Attacks by aphids, scale insects and borers rob trees of needed moisture. If any of these problems occur, leaf scorch appears earlier in the season and is more severe.

Any factor (environmental, nutritional, or pathological) that reduces root development and growth will weaken the tree and make it susceptible to root-invading organisms.

The organisms that attack the roots often are native to Idaho soils or they may be in the roots when the tree is purchased. Although nurseries make every effort to provide disease-free planting stock, it is impossible to guarantee 100 percent disease-free material.

Prevention: Control parasitic insects and minimize the effects of disease-causing organisms that occur on roots of trees. A balanced fertility program plus adequate water and good management will maintain the tree in a vigorous condition and, in turn, will help alleviate root disease problems.

Other Causes

There are countless other possible causes, not of disease origin, of leaf disorders of trees. Among these:

1. Young or recently transplanted trees may be girdled at the soil line by mice during the winter.

2. Lawnmower damage at the base of a tree is common.

3. Cats often shred and practically girdle young trees with their claws.

4. Trees can be injured by salt used to remove ice from streets, sidewalks or driveways. Roots are killed when the ice thaws. The trees may fail to leaf out in the spring, or the leaves may scorch after leafing out.

5. Brine spilled from ice cream freezers can cause summer injury to small trees.

6. Oil spilled around intake pipes for oil burners may seep into the ground and kill not only the grass but nearby trees.

7. Strong chemical agents used in the household disposal system may escape from septic tanks into surrounding soil and injure trees.

8. Pesticides for insect and disease control can cause problems if used improperly. Dormant sprays applied after trees have broken dormancy can be disastrous to the foliage. Xylene, an insecticide carrier, will cause leaf burn if the material is above 85 °F.

9. Soil sterilants and certain turf herbicides are troublesome if applied near trees. Some of these chemicals will reach into the root zone 2 to 5 years after application and cause severe damage to the trees.

10. Some tree species may not be able to endure an unusually severe winter. Damage can be present 2 to 3 years later.

11. And finally, some trees, like humans beings, just won't do well in your neighborhood — for no particular reason.

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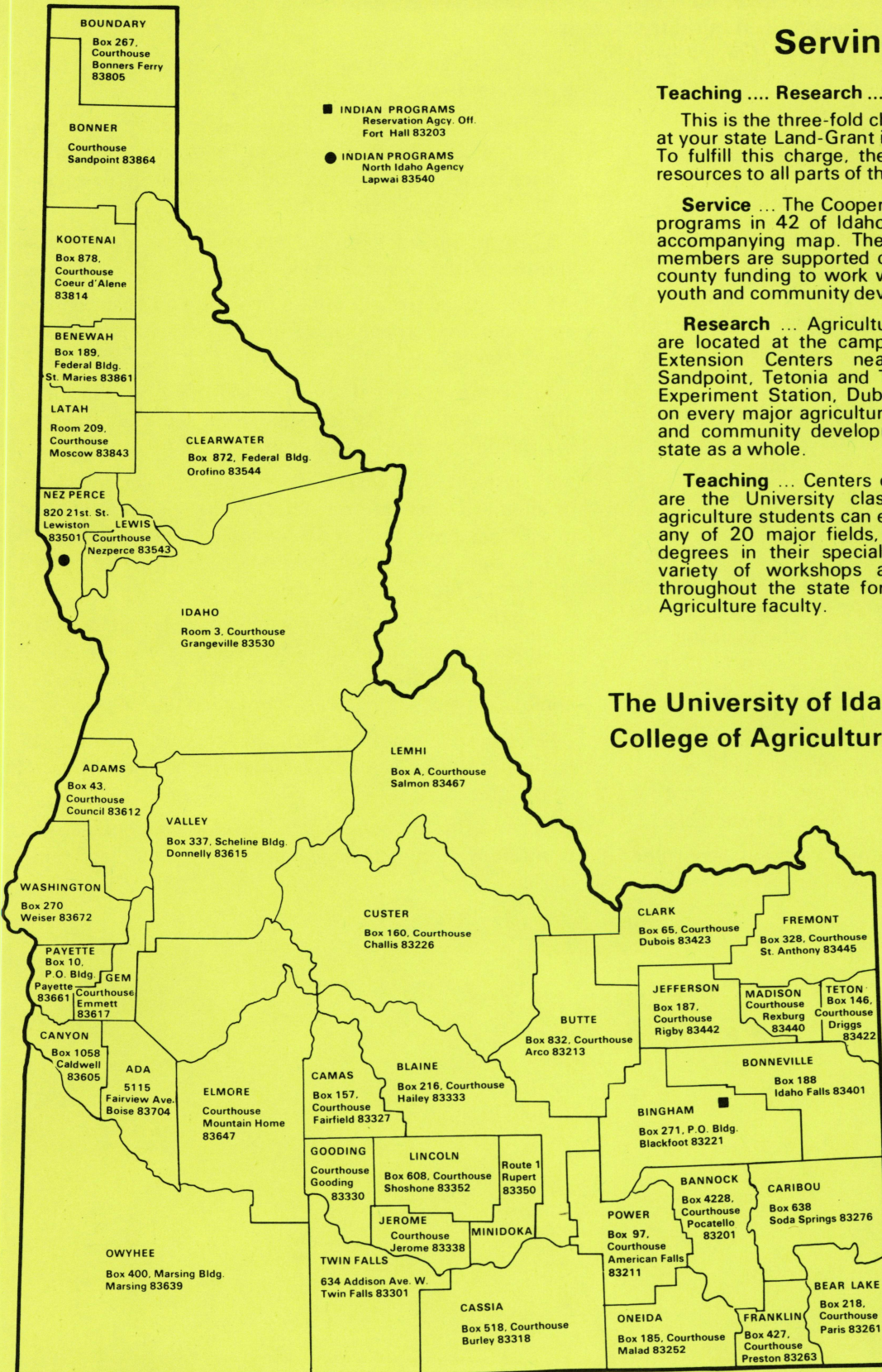
Teaching Research Service

This is the three-fold charge of the College of Agriculture at your state Land-Grant institution, the University of Idaho. To fulfill this charge, the College extends its faculty and resources to all parts of the state.

Service ... The Cooperative Extension Service has active programs in 42 of Idaho's 44 counties as shown on the accompanying map. These College of Agriculture faculty members are supported cooperatively by federal, state and county funding to work with agriculture, home economics, youth and community development.

Research ... Agricultural Experiment Station scientists are located at the campus in Moscow, at Research and Extension Centers near Aberdeen, Caldwell, Parma, Sandpoint, Teton and Twin Falls and at the U.S. Sheep Experiment Station, Dubois. Their work includes research on every major agricultural crop in Idaho and on economic and community development activities that apply to the state as a whole.

Teaching ... Centers of College of Agriculture teaching are located at the University classrooms and laboratories where agriculture students can earn bachelor of science degrees in any of 20 major fields, or work for master's and Ph.D. degrees in their specialties. And beyond these are the variety of workshops and training sessions developed throughout the state for adults and youth by College of Agriculture faculty.



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