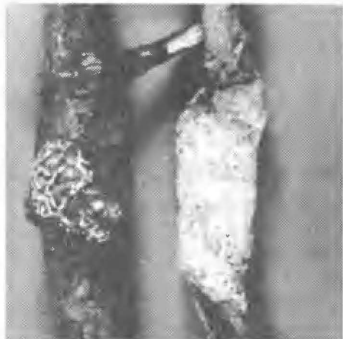


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Forest Tree Diseases of Virginia

September 1968

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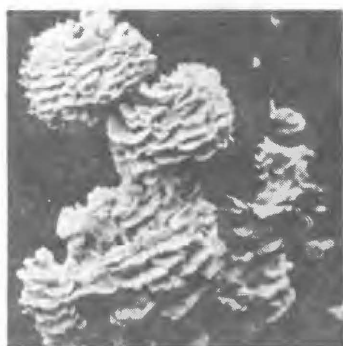
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Oak Wilt

by

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Forest land comprises 64 percent of the acreage of Virginia. Oak species account for approximately 40 percent of the total volume of the growing stock. The oaks suffer from several diseases including a very destructive disease which is similar to the more commonly known Dutch Elm Disease. Oak wilt is caused by the fungus, Ceratocystis fagacearum (Bretz) Hunt, and is a vascular disease of all known species of oaks. It has caused considerable

Figure 1. Oak wilt of red oak. Note complete defoliation. Ground underneath tree was covered by leaves which fell while still green.



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loss to the oak forests of the Lake States and may be of increasing importance to the oak forests of the East.

**Range:** Oak wilt was first discovered in Wisconsin in 1942 and has since been found in an area from Minnesota to Pennsylvania to North Carolina to north-west Texas. It is found primarily in the mountainous section of Virginia.

**Suspects:** There are between 200 to 300 species and hybrids of oaks and to date not one has proved to be immune to the attack of this fungus. Species belonging to the red oak group (black, scarlet, pin, southern and northern red oak) are more susceptible to infection than are species of the white oak group (white, chestnut, swamp white, or post oak). In addition to the oak species, American and oriental chestnut, chinquapin, tan bark oak, and rarely apple are also susceptible.

**Symptoms:** Observable symptoms of oak wilt occur from early June until leaf coloration is completed in the fall. There are two distinctly different symptom patterns depending upon the group of oaks affected.

**Red Oak Group:** Symptoms are characterized by a sudden wilting of the leaves



**Figure 2.** Oval shape mats of the oak wilt fungus which may be produced 3-9 months after death of the tree. Due to their fruit like odor these mats are usually covered with insects.

at the top of the tree and the wilting progresses downward through the crown at a very rapid rate. Wilting of the leaves is most often accompanied by leaf fall before the leaves have turned brown. Defoliation of the entire tree is usually complete 3-6 weeks after infection has occurred (Figure 1). The stems of wilted leaves are black at the base and a black streak discoloration may be present in the outer sapwood of diseased branches and main stems. THIS DISEASE IS EASILY DISTINGUISHED FROM LIGHTNING STRIKE DAMAGE DUE TO THE SUDDEN LEAF FALL; MOST LIGHTNING STRUCK TREES RETAIN THEIR LEAVES WHICH TURN BROWN. Another identifying sign of this disease are oval-shaped fungus pads which are produced under the bark of infected trees 3-9 months after wilting and defoliation. These black and gray fungus pads force open the bark and their fruit-like odor is very attractive to insects (Figure 2).

White Oak Group: Symptoms in this group of oaks are characterized by a slow wilt of a single small or large branch. Leaves usually remain on the tree and only the terminal portion of the affected leaves turns brown. Death of the entire tree is rare, but may occur 1 to 4 years after infection. The killing of individual branches over a period of years will result in stagheading of the crown and may be confused with root damage. Fungus pads are only rarely produced on infected white oaks.



Figure 3. Root grafts found between infected red oak tree and adjacent healthy red oaks.

**Control:** The oak wilt fungus spreads by several methods including wood boring insects, insects attracted to the fungus pads and then to wounds on healthy trees, and by root grafts to adjacent healthy trees (Figure3). Control measures are aimed at reducing the spread of the fungus from infected trees by killing all roots of the diseased trees to prevent spread by root graft and by reducing mat production. Infected red oaks will not survive after infection and should be removed as soon as possible to prevent spread. Due to the chance of recovery, the removal of white oaks is questionable under shade tree conditions and should be done only if the tree becomes unsightly or dangerous due to the presence of dead limbs.

The control of this disease is under the direction of the Virginia Division of Forestry, Charlottesville, and involves the use of 2,4,5-T or sodium arsenite placed in a deep axe cut girdle at the 1 foot height of affected trees. The chemical solution is also placed in axe cuts made into roots at the ground line. These chemicals promote rapid drying of the above ground portion of the tree, prevent or reduce fungus pad formation, and kill roots which in turn reduce the chance of spread. **SINCE SODIUM ARSENITE IS EXTREMELY TOXIC TO ANIMALS AND PLANTS, IT SHOULD ONLY BE APPLIED BY EXPERIENCED PERSONNEL.**

Under home lawn conditions, these chemicals should not be used until the risk involved in killing adjacent trees is fully realized. Careful application of a Vapam (soil fumigant) barrier may be used to prevent spread under some conditions. Specific recommendations involving the use of vapam are available upon request.

**Laboratory diagnosis:** Suspect disease branch specimens should be collected from wilted portions of the trees, wrapped in moist material and mailed, first class to the Virginia Division of Forestry, c/o C. L. Morris, Chief, Insect and Disease Investigations at Charlottesville, Virginia (22903) or to the Plant Disease Clinic at V.P.I. Control (if required) will be conducted free of charge by personnel of the Virginia Division of Forestry.

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1. Read the label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed, or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label. If disposal instructions are not printed on the label, burn the containers where smoke will not be a hazard, or bury them at least 18" deep in a place where water supplies will not be contaminated.

**SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER USE OF PESTICIDES.**