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1970 OAK WILT SURVEY IN SOUTH CAROLINA

by
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ABSTRACT

A survey for oak wilt was made by S. C. State Commission of Forestry personnel in Kershaw County and 5 adjoining counties to the north, east and south. The 1,523,700 acres were surveyed at 50% aerial coverage. Eight new spots were confirmed by laboratory analysis at Clemson University of samples collected from suspect trees by Commission foresters. The disease was discovered in two counties for the first time, Chesterfield and Lee, which had one spot each. No control efforts were attempted since only a small percentage of active oak wilt spots were detected. Reports from other southern states indicate that oak wilt control efforts have not been sufficiently beneficial to justify their continuation.

INTRODUCTION

Oak wilt disease, caused by the fungus Ceratocystis fagacearum (Bretz) Hunt, is a vascular disease of oak. It is particularly destructive to the red oaks, capable of killing them in a few weeks. Diseased white oaks may live for several years.

The first spot of oak wilt in South Carolina was discovered in Camden (Kershaw County) in 1968. This spot, in the yard of a dwelling house, was about two years old. Fourteen water oaks that were dead or showing wilt symptoms were removed including the stumps. Each year one additional water oak has died. These two trees have been removed and the stumps treated with Ammate.

A second spot was discovered in Camden in 1968 near the first. All dead or diseased trees were removed and the stumps treated. Additional trees have died each year and they have been likewise treated.

In June 1969 Kershaw County was surveyed for the disease. Flight lines were one mile apart for a 100% survey. Of the 114 spots recorded aerially, 48 were checked and 22 sampled. Nine spots were confirmed as having the fungus Chalara quercina (Henry) which is the imperfect stage of Ceratocystis fagacearum (Bretz) Hunt. These spots plus a suspicious spot were treated. Treatment included cutting all trees within 50 feet of diseased trees, spraying them with benzene hexachloride (BHC) in diesel fuel and treating the stumps with Ammate.

Eleven counties to the northeast of Kershaw County were also surveyed in 1969. No oak wilt was found in samples from suspect spots in these counties. Other data are in the report OAK WILT IN SOUTH CAROLINA, 1969 SURVEY AND CONTROL REPORT by John E. Graham and Wesley Witcher, published by the S. C. State Commission of Forestry, Columbia, S. C.

METHODS

In mid-June 1970 Kershaw County County, plus five additional counties to the north, east and south of the 1969 oak wilt spots were surveyed. The 1,523,700 acres covered are

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shown in Figure 1. Survey lines were two miles apart for 50% coverage. Two survey crews, each consisting of a pilot, a tracker and two observers, made the survey. Flight lines were oriented from aerial photographs in a north-south direction. Observers recorded suspected spots and numbers of trees on the photographs. The pilot attempted to keep the airplane between 500 and 800 feet above ground level and at 85 to 100 miles per hour airspeed. The low altitude was required since most of the hardwoods in the area are small scrub type such as turkey oak (Quercus laevis Walt.).

Foresters attempted to locate all spots on the ground and determine probable cause of tree decline. All spots suspected of having oak wilt diseased trees were sampled. At suspect spots 50% of the dying oaks were sampled with a maximum of three trees per spot. At least two limbs per tree in the infected portion of the crown were sampled. Samples were mailed to Clemson University each afternoon for culturing in the laboratory. Dr. Wesley Witcher, Forest Pathologist in the Department of Plant Pathology and Physiology, directed the laboratory work.

The objective of the survey was to determine whether oak wilt was present in counties adjacent to Kershaw County and the extent of the disease in Kershaw and adjoining counties.

RESULTS

The results of the survey are summarized in Table 1. Aerial observers recorded 252 spots of dying trees. Foresters made ground checks of 246 of the spots. Samples were taken at 48 spots. Foresters also sampled 25 pick-up spots that were not recorded by aerial observers. Eight of the spots were confirmed as having oak wilt. Six were in Kershaw County and one each in Chesterfield and Lee.

DISCUSSION

The 1969 and 1970 surveys could not be compared since they were made at different intensities and in different locations for the most part. Only Kershaw County was surveyed each year, but the surveys were not comparable. However, the data indicates that there was less oak wilt discovered in 1970 than in 1969. Table 2 summarizes the data.

During ground checks foresters sampled 25 pick-up spots that were not recorded by aerial observers. Most of these spots were near recorded spots or along flight lines and should have been recorded. Four of these spots contained trees with the oak wilt disease.

These facts point up the difficulty observers had in seeing oak wilt suspect spots in the area surveyed. Several things contributed to this. Many of the oak stands in the area are small scrub oak type such as turkey oak (Quercus laevis Walt.). Symptoms of the disease do not stand out sufficiently in these small trees for them to be observed easily. Observers had very little experience with this kind of survey situation. Spots can be easily hidden by larger trees. A drought had occurred in this area during the months of spring and early summer. Drought stressed oaks became common at the time of ground checking, adding to the difficulty of finding the aerially recorded spots.

In the 8 confirmed spots 19 trees were sampled. Nine of the trees were confirmed as having the oak wilt organism. Six trees were turkey oak (Quercus laevis Walt.), one was bluejack oak (Quercus cinerea Michx.), one was willow oak (Quercus phellos L.) and one was southern red oak (Quercus falcata Michx.).

One of the spots was confirmed after a resampling but it was an additional sample tree that had the disease. This indicates that either trees declining from some other cause are mixed in with oak wilt trees, or the disease is difficult to culture out of specimens, or the sampling and handling procedure is not reliable.

Survey results indicated the possibility that only a small percentage of the oak wilt spots was discovered. Reviews of oak wilt surveys and control efforts in other southeastern states have led several to discontinue treatment. They report that the disease is increasing no more in areas where no controls are applied than where they are. These facts led to the conclusion that treatment efforts in South Carolina should not be undertaken at this time.

RECOMMENDATIONS

1. There remains a need to survey for oak wilt to locate all spots possible. This will provide an idea of how much is present and the location. The S. C. State Commission of Forestry will seek ways to improve survey reliability, utilizing recommended aerial and ground survey methods.

2. No control efforts are recommended for forest stands of low value oak species. Where oak wilt infection centers are found in high value trees such as shade or ornamental trees or trees in recreation areas, etc. treatment will be recommended. Current treatment recommendations call for the cutting of infected trees and adjacent trees that might be infected through root grafts. Stumps should be treated or removed and other portions of the tree burned or sprayed with BHC in fuel oil.

TABLE 1

SUMMARY OF OAK WILT SURVEY
1970

County	Acres Surveyed	Percent Coverage	Spots Recorded No.	Spots Ground Checked No.	Oak Wilt Suspect Spots Sampled No.	Trees Sampled No.	Oak Wilt Spots Confirmed No.	Oak Wilt Trees Confirmed No.
Chesterfield	507,500	50	43	41	6	12	0	0
Darlington	189,200	50	56	56	8	13	0	0
Kershaw	419,100	50	71	68	25	41	3	3
Lancaster	116,600	50	16	15	0	0	0	0
Lee	200,200	50	43	43	5	8	1	2
Sumter	91,100	50	23	23	4	5	0	0
	1,523,700		252	246	48	79	4	5

PICK-UP DATA FROM GROUND SURVEYS
(Oak wilt suspect spots observed and sampled that were not detected from the air.)

	Pick-up Spots Oak Wilt Suspects No.	Trees Sampled No.	Oak Wilt Spots Confirmed No.	Oak Wilt Trees Confirmed No.
Chesterfield	3	7	1	1
Darlington	0	0	0	0
Kershaw	19	35	3	3
Lancaster	3	5	0	0
Lee	0	0	0	0
Sumter	0	0	0	0
	25	47	4	4

TOTAL CONFIRMED OAK WILT FROM AERIAL AND PICK-UP SURVEYS

	Spots (No.)	Trees (No.)
Chesterfield	1	1
Darlington	0	0
Kershaw	6	6
Lancaster	0	0
Lee	1	2
Sumter	0	0
	8	9

TABLE 2

SUMMARY OF OAK WILT SURVEY
in
KERSHAW COUNTY FOR 1969 AND 1970

Year	Acres Surveyed	Percent Coverage	Spots Detected No.	Spots Checked No.	Spots Sampled No.	Oak Wilt Spots Confirmed No.	Pick-up Spots Sampled No.	Pick-up Spots Confirmed No.	Total Oak Wilt Spots Confirmed No.
1969	503,100	100	114	48	27	9	-	-	9
1970	419,100	50	71	68	25	3	19	3	6

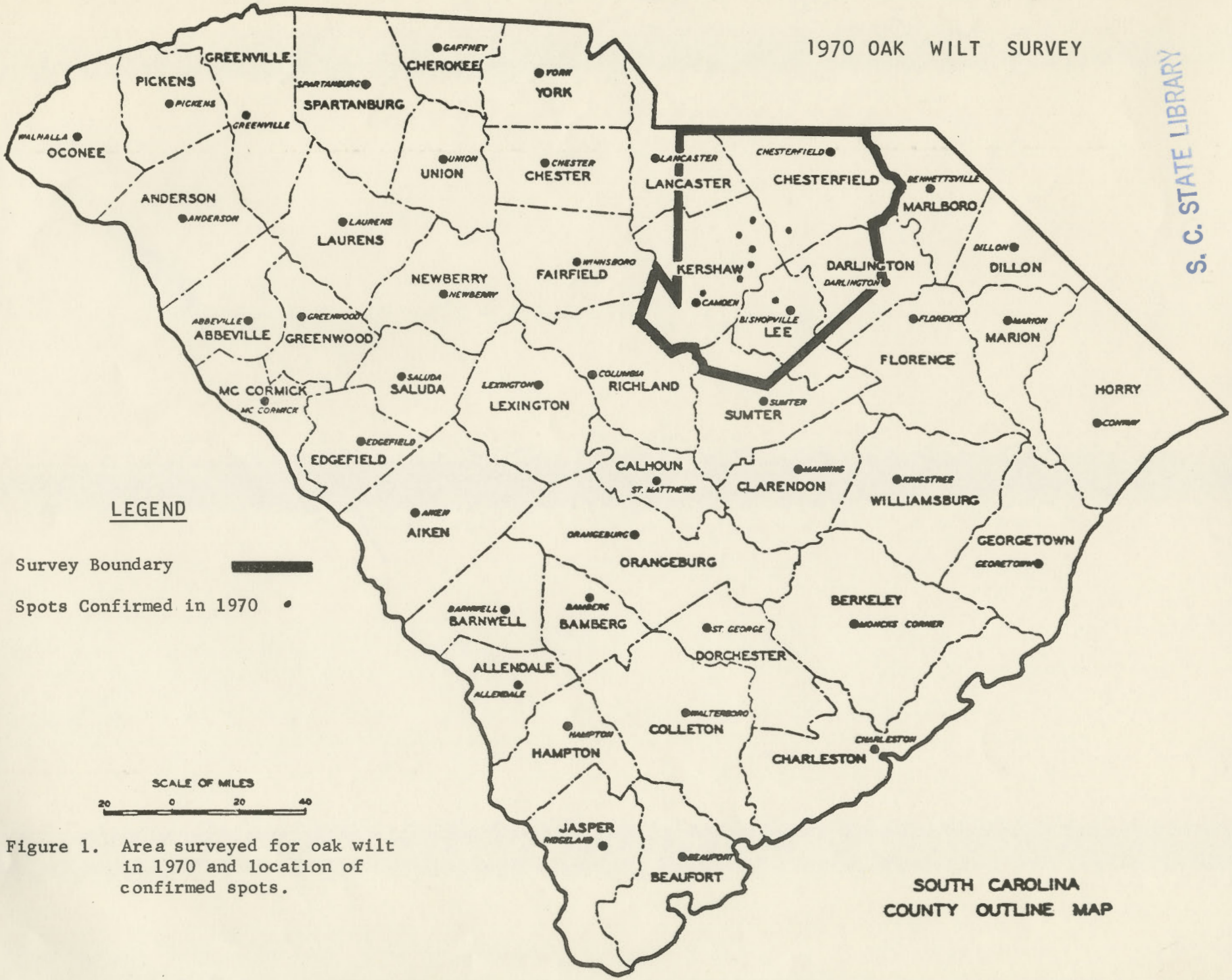

Figure 1. Area surveyed for oak wilt in 1970 and location of confirmed spots.

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