

# THE PRESENT STATUS OF THE DUTCH ELM DISEASE<sup>1</sup>

GEORGE R. GAGE

PROFESSOR OF BOTANY, VANDERBILT UNIVERSITY

It is not my intention, in presenting this paper, to unduly alarm the members of the academy, but rather to place before them certain facts concerning the severity of a plant disease, which, if not already present, has every possibility of spreading into this part of the country. I refer to the so-called Dutch elm disease. Due to insufficient allotment of funds, the United States Department of Agriculture has been unable to carry on the proper and nation-wide survey that such an insidious disease justifies. The discovery of the disease in new localities has been left to the general public which has been requested to be on the lookout for it. This is a very unfortunate condition of affairs and I do not hesitate to predict that, if the discovery of this disease in our state is left to the casual observance and initiative of the general public, it may become so well established as to be impossible of eradication or control. However, when a handicapped Department of Agriculture does have to resort to solicitation of this sort of aid, it seems only proper that those who have had training in plant pathology or those who are scientifically inclined should be the first to respond. Action on my part is hastened by the fact that recently there has been an abnormal number of deaths among the elms here in Nashville and the surrounding territory. It may be that these deaths have not been due to the Dutch elm disease pathogene, but it would be highly advisable to know what our trouble is and to have on hand well organized remedial plans should it become epidemic in nature. I believe that it is not too soon for the State of Tennessee, through its proper agencies, to take some action in the matter and that we should use our influence to see that a thorough survey is immediately undertaken.

The Dutch elm disease is caused by an ascomycetous fungus, *Ceratostomella ulmi* (Schwartz) Buisman, the imperfect stage of which is *Graphium ulmi* Schwartz. Two European bark beetles, *Scolytus scolytus* and *Scolytus multistriatus*, are evidently the chief agents whereby the pathogene is spread. The latter of these two is established in this country and is frequently found in diseased trees. The pathogene has been isolated from both its larval and adult forms. The disease was introduced into this country with the importation of burl-elm logs of European origin. Both species of the beetle have been collected and the pathogene isolated from such logs which have recently been intercepted at the ports of New York, Baltimore, Nor-

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folk, and New Orleans. So far the only method of control has been that of eradication. This consists of cutting down and burning all diseased trees found.

For a more detailed description of the disease in all of its phases, I shall refer you to Circular 332 of the U. S. Department of Agriculture, Extension Bulletin 290 of the New York State College of Agriculture, and to the Plant Disease Reporter of the Bureau of Plant Industry. It is from these publications and from the authors of the same that I have obtained most of my information and to whom I wish to acknowledge due credit. I shall confine my remarks to the history and status of the disease.

#### HISTORY AND STATUS OF THE DISEASE IN EUROPE

The Dutch elm disease was first discovered in Holland in 1919. In 1920 it became increasingly severe. By 1931, sixty to seventy per cent of the trees in southeastern Holland were already cut down and the disease had begun to spread into the northern provinces. It has been reported that since 1920 Rotterdam and Utrecht have removed approximately fifty per cent of the 31,000 trees affected with the disease. In 1932, in Holland, 26,000 trees were designated for destruction. In 1920, the disease spread from Holland into Belgium and northern France. In 1925, the elms in the avenues of Versailles, France, were attacked and by 1932 the famous avenue leading to the Grand Trianon had been replanted with lindens. Sixty to seventy per cent of the elms in the courtyard on the town side of the palace were reduced to stumps. In Germany the disease was first discovered in 1921. By 1923 ten per cent of the elms in Bremen were found to be diseased and 469 trees were immediately cut down. In 1924, widespread damage was reported and by 1931 Bremen had destroyed 2,000 trees. In 1931, it was predicted at the meeting of the German Botanical Society that there would be a total destruction of all of the old stands of elms throughout central Europe. The first discovery of the disease in Italy was made in 1929 in one district of the province of Emilia. By 1930, the disease occurred sporadically throughout the entire province. This spread continued through 1931 and 1932. In England, the first discovery was made in 1927 near London. The disease is reported now as being quite severe in some southeastern counties of that country. In localities where counts were made, dead trees averaged as high as nine per cent. The *London Times* reported that the disease has made definite progress during 1934 in every area examined and, furthermore, that a renewed onset has occurred in many trees that had previously been reported as recovering. Other European countries in which the Dutch elm disease has been reported are Switzerland, Austria, the Balkan States, Poland, and Czechoslovakia.

#### HISTORY AND STATUS OF THE DISEASE IN THE UNITED STATES

In 1930, three diseased trees were found in Cleveland and one in Cincinnati, Ohio. In 1931, four more were found in Cleveland. One

more was found in this same city in 1933. Due to prompt action on the part of state and Federal agents, the disease has apparently been eradicated from this Ohio area. It may be mentioned that the Scolytus beetle is not present in this area which may have had something to do with the smallness of the area of spread.

In the fall of 1932, a single elm in Memorial Park, Maplewood, New Jersey, showed a yellowing and wilting of the foliage of a single branch. Due to the lateness of the season when its condition was evident, it was thought to be due to the drought which brought on early maturity. However, in the spring of 1933, this particular branch failed to come into leaf and soon other branches began to turn yellow and wilt in spite of the excessive rainfall. Specimens were sent from the New Jersey Experiment Station to the Dutch Elm Disease Laboratory which had been established at Wooster, Ohio. Cultures were made from these specimens and the imperfect stage of the pathogene, which is responsible for Dutch elm disease, was isolated. On June 26, the tree from which these specimens were taken was dead. Examination showed it to be infested with the European bark beetle. By July 27, 69 infected trees were found in 14 different northern New Jersey towns and cities. By September 15, a total of 402 had been discovered; 388 of these were in 44 different localities in New Jersey and 14 in 6 different localities in New York. By October 15, the total reached 577; 546 in New Jersey, 29 in New York, 1 in Connecticut, and 1 in Ohio. By October 29, the total was 668; 618 in New Jersey, 47 in New York, 1 in Connecticut, and 1 in Ohio. By March, 1934, the total was 1,200; by June, 1934, 1,415; by July, 1934, 4,426. The last official report of this year on October 10, gives a total of 7,432 trees. This includes all infected trees since the discovery of the disease in this country; 4,940 of these were found in New Jersey, 2,420 in New York, 56 in Connecticut, 11 in Ohio, 1 in Maryland, and 4 which have recently been found in Indianapolis, Indiana. (Since the presentation of this paper at the Academy meetings, a diseased tree has been found in Norfolk, Virginia.)

The conclusions to be drawn from these figures are that the disease must have been widely spread in the New Jersey-New York area before it was discovered; that it is still spreading at an alarming rate; and since it has been found in Ohio, Maryland, Indiana, and Virginia, as well as in New York, New Jersey, and Connecticut, it may sooner or later be found here in Tennessee.

Elms constitute some of our most valuable shade trees, and Tennessee is one of the six leading states in elm lumber production. Should we take the chance of permitting the Dutch elm disease or any other elm disease to become established in our state?