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The Chestnut Bark Disease

A Grave Danger which Threatens
Our Forest Trees, with
Its Remedy

STATE FORESTER'S OFFICE
BOSTON, MASS.
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BOSTON
WRIGHT & POTTER PRINTING CO., STATE PRINTERS
18 POST OFFICE SQUARE
1911

Approved by
The State Board of Publication.

By Transfer
OCT 6 1911

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1911

THE CHESTNUT BARK DISEASE.

The Disease and its Method of Attack.

The State Forester wishes to call the attention of the citizens of the Commonwealth to a serious disease of the common chestnut (*Castanea dentata*), — a disease which has been working for some time in the States of New York, New Jersey, Connecticut and Pennsylvania, and which has been found to be slowly gaining a foothold in Massachusetts. This disease is caused by a fungus known botanically as *Diaporthe parasitica* (also as *Valsonectria parasitica*), and grows in and derives nourishment from the tissues of the inner bark of the chestnut tree. The fungus is conveyed from one place to another by means of "spores" or fruiting bodies, which are analogous to seeds in the higher orders of plants. These spores, being small and very light, are easily carried long distances by the wind, and when blown against a chestnut tree find lodgment in any wounds, of which even the healthiest tree often has a great many, that may be in the bark. It makes no difference with the disease whether the spores find a refuge in the tissues of the thick bark of the trunk or the thinner bark of the small twigs, — the fungus develops equally well. It is true that in localities where the disease is rare the spread is slow, but the fact that it can increase to an alarming rate has been proved in our sister States, where it is no exaggeration to say that in certain sections the chestnut is becoming extinct.

Growth.

The spores having gained an entrance, the fungus begins to spread by sending out many small fibers, much in the same way that a plant sends out roots. These fibers, pushing about and through the growing cells of the tree to obtain nourishment, form a close network which soon saps the life of the section where they are.

Now, the serious part of this process of growth, looked at from the tree standpoint, lies in the fact that the fungus shows a marked tendency to grow around the infected branch or stem, thus girdling it, and killing all growth above that point. When this happens to the trunk of a tree it is easily seen that it becomes a serious matter.

Furthermore, the trunk of a tree may be infected by spores coming from diseased parts of its own branches, thus multiplying the disease within itself so to speak.

Appearance of Diseased Parts.

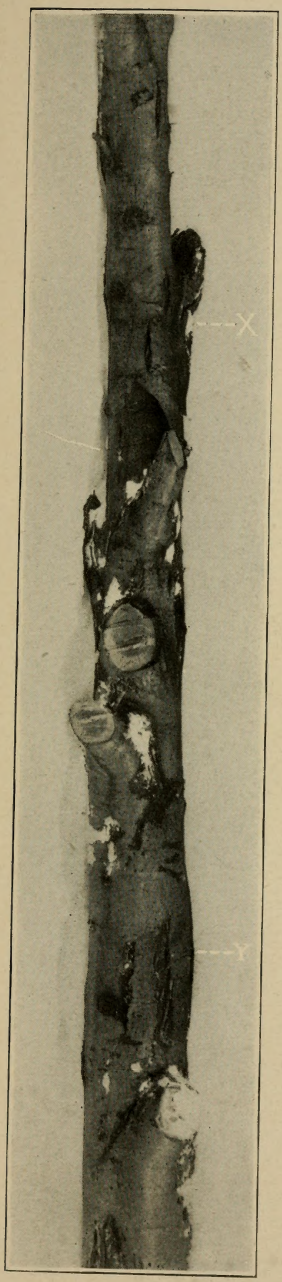
The following features are characteristic of the external appearance of the diseased tree. The outer bark over the diseased part is of a slightly reddish tinge, more so than the rest of the bark, and as the disease progresses this reddish area becomes covered with yellowish, brownish, or orange-colored pustules. Further, in damp weather or damp situations the spores are often extruded in the form of greenish-yellow "strings." The bark splits open up and down the length of the infected spot and often shows a swelled appearance. The cracks are filled with twisted and criss-crossed fibers of a slightly yellowish color. Among the smaller branches the cracks are of course less visible, but they still occur.

It should be here stated that these same characteristics may be the result of the work of other species of fungi than the one in question, and therefore, in order to be sure, specimens should be sent to a botanist for a microscopic examination. Such identification will be gladly made by the Bureau of Plant Industry, United States Department of Agriculture, Washington, D. C., or by the Massachusetts Agricultural College, Amherst, Mass.

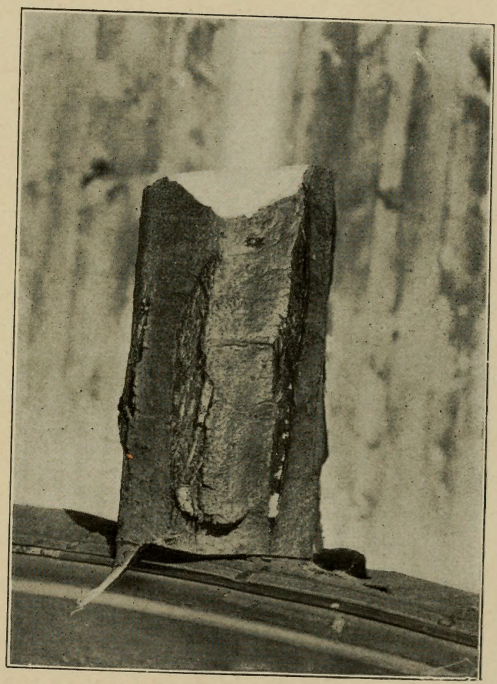
Time for making Observations.

The best time for seeing the evidences of the work of this fungus is the season now approaching, viz., in the spring, when the leaves begin to appear. The reason for this is not that the disease does the greatest amount of damage at this time, but because trees that have been injured the previous season by having much of their live tissue destroyed, instead of putting forth

Two trees killed by the disease. Note the dilapidated or shreddy appearance of the bark and the few persistent dead leaves; also, portion of upper part of left-hand tree, where bark is falling off. (All photographs taken at Wilbraham, Mass., Feb. 23, 1911.)



Infested stem. The fungus tends to girdle the diseased portion rather than to extend up and down. "x" and "y" are diseased sections.



Infested trunk, showing how bark splits open. (This is a nearer view of section marked "y" in photograph to the left.)

healthy new leaves can produce only sickly and stunted foliage, the extent of the blighted area depending on whether the main stem or only a branch was attacked.

Methods of Control.

It should be understood that there is no known method of curing the disease, or of saving woodland once it has become thoroughly infested. The experience of other States has proved this. Nor is it possible to save single trees, if badly diseased, except at great expense, and even then the chance for failure is great, owing to the impossibility of locating all the infected spots.

Vigorous Measures needed in Early Stages.

To check its spread at the beginning of its entrance into a locality is, therefore, the only hope, and this hope is considered a strong one by those who have studied the disease most.

Dr. Haven Metcalf, who is the pathologist in charge of investigating this blight for the government Bureau of Plant Industry, and who has spent a great deal of time in this work, states that "in all cases we know of where the disease has been carefully eradicated, in localities where it has just appeared, the work has been very successful; so that we feel warranted in advising a very considerable outlay of energy to eradicate the disease at the outset."

Methods of Eradicating.

Inspection of Nursery Stock.

There are several ways of going about the eradication of the blight. All chestnut nursery stock should be carefully inspected for signs of the disease, as such stock has heretofore apparently been one of the chief agencies of spreading the fungus. This precaution should be taken by nurserymen and purchasers alike.

Prompt Destruction of Diseased Trees.

A careful inspection of trees for evidences of the disease should be made by all owners of chestnut woodland during the months of May and June, and any tree found infected should at

once be cut down, the wood put into marketable form, and all brush, and if possible all patches of diseased bark, burned at the first opportunity. If this is not done, the down tree merely becomes a center of infection for the rest of the woods, as it is known that the fungus may live on dead bark for at least six months after cutting.

In answer to the question as to whether sprouts from the stumps of infected trees that have been cut will also themselves be infected, it should be said that for the first year at least they will not be, but after that they should be carefully examined for signs of the disease.

Treatment Other than Cutting.

Spraying.

Experiments have shown it to be a matter of doubt as to whether the spraying of infected trees is of any avail against this fungus. It is possible, however, that in the case of valuable shade trees very frequent sprayings might have a tendency toward preventing infection.

Broken limbs, wounds, cracks and crotches of branches are fruitful sources of attack, and the fungus should be looked for at these points.

Local Cutting of Infected Spots.

The other method of individual treatment that has proved successful, though only in the case of valuable trees, where the expense was warranted, is the one of cutting and removing all patches of diseased bark and carefully protecting the exposed surface with a coat of tar or paint. This treatment must be thorough, and even then it will do no good if the disease has progressed too far. Infected branches should be removed altogether, at a good distance below the point of infection, and any bark cutting should be done at least an inch beyond and outside of the discolored area, which shows the location of the fungus.

A tree that has been already girdled should be cut down at once, and trees under treatment should be inspected frequently, say about June 1, July 15 and September 1, or oftener in wet weather.

Co-operation Necessary.

It is believed that by carefully following the foregoing instructions the disease can be kept under control in Massachusetts, with the constant hope that some natural enemy will appear to assist in the work. No controlling enemy, however, is known at present. All persons are therefore urged to do their utmost, either by reporting cases to this office or by actively using some of the above measures of control, to aid in checking this enemy of one of our best timber trees.

Bibliography.

Reference is made to the publications of the United States Department of Agriculture on this subject, especially Bulletin 141, Part V., of the Bureau of Plant Industry, from which several extracts, including quoted passages in this pamphlet, have been taken (those who are interested are advised to obtain a copy of this bulletin); also to a report of the Main Line Citizens' Association of Haverford, Pa.

Conclusion.

Lest the serious results of this disease be underestimated, the following instances of its work in other localities are cited: —

"A survey of the Forest Park, Brooklyn, showed 'that 16,695 chestnut trees were killed in the 350 acres of woodland in this park alone. Of this number, about 9,000 were between 8 and 12 inches in diameter, and the remaining 7,000 or more were of larger size.'"

"In a recent publication Dr. W. A. Murrill estimates the financial loss from this disease 'in and about New York City' at 'between five and ten million dollars.'"

With this loss in a city it can readily be seen what an enormous loss would occur should the disease become prevalent in the woodlands.

It becomes a question, therefore, as to which is the better economy, — to do nothing, and lose our chestnut trees, or to do our utmost at this early stage, with a fair chance of saving them.

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