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DO DORMANT CURRANT PLANTS CARRY PINE RUST?

SUMMARIZED BY

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F. C. STEWART AND W. H. RANKIN.

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OF

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**Fungi living
on different
plant species.**

It is a peculiarity of certain rust fungi that they must live part of the time on host plants of entirely different species. The well-known apple rust would disappear in any locality where all cedar trees were cut down so that none were left on which the so-called "cedar apples" could develop. These "apples" are fruiting bodies of this stage of a fungus, and from them the infection spreads, not to other cedar trees, but to the apple. Here the fungus assumes an entirely different form and bears fruiting bodies of a type very unlike cedar apples. These produce spores which may again infect the cedar.

Another fungus of this same type appears in one stage only on the pine and in others on the currant. This fungus, with the two diseases it produces, was unknown in the United States until within recent years and is still uncommon, so there is some hope of restricting its spread. This makes it advisable to prevent its transmission in every possible way. On the currant this fungus produces felt rust, a disease of very little economic importance; but on certain pines — those with needles in groups of five, of which the white pine is most abundant and most important — it causes blister rust, a very destructive trouble.

**How the
currant
and pine
fungus
spreads.**

The fruiting bodies of the fungus in its pine-inhabiting form cannot infect other pines, but very readily pass to species of *Ribes* (currant and gooseberry), principally the black currant, even though these are at considerable distances from the diseased pine. On the currant leaves, the fungus produces two fruiting forms, one of which *can* infect other currant plants and thus spread the disease rapidly among currants, but *cannot* infect pine; while the other form *can* infect pine but *not* currant.

* This is a brief review of Bulletin No. 374 of this Station, by F. C. Stewart and W. H. Rankin, entitled Does *Cronatium ribicola* Overwinter on the Currant? Those specially interested in the detailed account of the investigations will be furnished, on request, with a copy of the above-mentioned bulletin. The names of those who so request will be placed on the Station mailing list to receive future bulletins as issued, either Popular or Complete edition as desired.

As the currant drops its leaves in the fall, it has generally been believed that the plant retains no fungus fruiting bodies in the spring which can infect either currant or pine; but that new outbreaks of the currant rust must again originate in the pine blister-rust fungus.

Mysterious outbreaks. But outbreaks of currant rust on the Station grounds, first in 1906 and again in 1911 and 1912, cast some doubt on the assumption that the fungus cannot pass the winter on the currant and renew the disease there without the intervention of the pine blister-rust form. Quite careful search had failed to reveal the disease on pine trees anywhere near the Station or near other currant plantations about Geneva, in which the felt-rust had appeared.

This was a rather serious matter; for if the fungus can remain alive on the currant over winter it would be unsafe to ship currant plants from any rust-infected section. The risk to the pine would be too great.

Fungus does not survive winter on currant. To test the possibility of this overwintering and reinfection of currant in the spring from the felt-rust form of the fungus, about 500 yearling plants of black currant were dug in November, after the leaves had fallen, from a nursery near Geneva in which practically every leaf had shown the disease. These were distributed to various students of

plant disease, widely separated over the northeastern United States, and were, after a season of rest, brought into greenhouses and forced into growth. *In no case did the disease reappear.*

This was true, also, in those cases where an attempt was made to spread the infection by means of the fallen leaves. Many of these leaves were saved and kept outdoors in wire baskets until spring, when they were brought into the greenhouses and used to inoculate the currant plants growing therein. No disease resulted, although every condition was made favorable for germination of the fungus spores if any living ones had been present. The same plants, or others under the same conditions, took the disease very readily when inoculated from the fruiting bodies of the fungus found on pine trees.

Diseased pines found. For, after very careful search by nursery inspectors of the State Department of Agriculture, two such diseased trees were finally found, at quite a distance from the Station, it is true, but in such a position that it was possible to trace to them, through intervening currant plantations, the origin of the very puzzling outbreaks previously observed on the Station grounds and elsewhere. After the greenhouse experiments failed it became morally certain that there *must be* some such trees; and the nursery inspectors determined to examine every five-leaved pine anywhere in the vicinity of Geneva. The two found were in a bunch of eight culls left in the nursery block

after the other trees, probably imported seedlings, had been sold. They were later destroyed, so that it is hoped there will be no further outbreaks of currant felt-rust and no more cases of pine blister-rust near Geneva.

Currant quarantine unnecessary. Of course, negative experiments cannot *prove* a case; but these careful tests made with so many plants and under such favorable circumstances, seem to show that there is no danger of transmitting either pine blister-rust or currant felt-rust by leafless *Ribes* plants sent out in the spring. It is therefore believed unnecessary to exclude from shipment currant plants from nurseries where currant rust has prevailed. No pines should, however, be sent out from such nurseries until it is clearly proved that they have not been infected.