

trees growing in the vicinity. Should a spore alight on a wounded surface of a tree, it germinates and produces a fine germ-tube (hypha) which penetrates cells of the wood, where it grows and branches repeatedly, the branches (hyphæ) penetrating into the killed cells. It is probable that from the tips of the hyphæ is secreted a substance which has a solvent action on cell walls. This substance kills cells in advance of the hyphæ, and acts on them in such a manner that they may readily be penetrated by the hyphæ.

Stereum is normally a saprophyte, growing on dead stumps of poplar, willow posts, and fallen logs of those trees, but, should opportunity arise for its hyphæ to penetrate living tissues through some wounded surface, it becomes an active parasite. In living branches hyphæ are confined to the wood, where they grow toward the apex of the branch much more rapidly than toward the root. When all cells in the vicinity have been killed, and the branch in consequence has died, hyphæ grow to the surface, where they branch repeatedly to form fructifications on which spores are produced, so completing the cycle.

Fructifications, and consequently spores, may be produced at any time of the year. They appear more frequently during wet weather, and favour a moist atmosphere such as surrounds the base of a tree when it is covered by grass or weeds. Spores may be produced at intervals during the life of the fructification, which in many instances persists for several seasons.

The fungus infects living trees only through wounds, which in orchard practice are constantly being inflicted on trees. During cultural operations portions of bark are frequently abraded by chains, swingletrees, or cultural implements. In picking, branches frequently become broken or split at the forks. In pruning, small wounds are made by the secateurs and large wounds by the saw. Pests such as woolly aphis or cicadas form cankered areas which afford excellent opening for the entry of spores.

Preventive Treatment

The fungus is spread by spores produced on the fructifications, and by that means alone. Spores gain entry into tissues of a tree only through a wound or bark injury. By removing fructifications and coating wounded surfaces with a protective covering the disease can be kept within reasonable limits, if not defeated altogether.

The following treatment is recommended:—

Remove and burn branches and stumps that show signs of silver leaf or have been killed by it. Destroy dead stumps of shrubs and trees carrying fructifications of *Stereum*. It is not sufficient to cut off the fructifications, as the wood is permeated with mycelium, which will produce more fructifications as soon as conditions are favourable.

Protect wounded surfaces over lin. in diameter, so that spores cannot enter crevices. This first necessitates cutting all broken branches off cleanly, an operation which should be performed as close to the main branch as possible, so that the wound may quickly callus over. Injuries caused in cultural operations should be dressed smooth, and loose pieces of bark removed.

Finally, exposed surfaces should be dressed with a wound covering as soon as they are made. The most efficient has proved to be bitumen paint, which not only provides an excellent cover, but does not adversely effect bark or wood (J. D. Atkinson, "Orchardist of New Zealand," Vol. 11, 1938). Wound dressings should be renewed annually or until the wounds callus over. This is a necessary precaution, as all large wounds have a tendency to crack and expose wood uncovered with any protective coating.

The disease is not spread by secateurs used in pruning operations.

Spraying is useless for controlling silver leaf, as the mycelium is internal and cannot be reached by sprays. Sulphate of iron, which was at one time freely recommended, has proved ineffective, and injections into the tree of substances toxic to the fungus have proved useless as a controllant.

Measurement of Areas

Rectangles: The area is reckoned by multiplying the length by the breadth.

Where each of the four sides of a rectangular paddock is of different length the length of opposite sides should be summed, the average taken, then the average length multiplied by the average width.

With paddocks of more than four sides special means may be required to compute acreage accurately; where such irregular areas can be subdivided into a series of rectangles and triangles (half rectangles) the sum of the areas of these will give the acreage.

The actual ground acreage of hill country sections can be only approximately gauged from fence-line measurements. In practice it is customary when sowing these to make allowance for this fact by estimation of the additional acreage due to surface configuration.

Circles:

Circumference = diameter x 3.1416.

Diameter = circumference x .3183.

Area = diameter squared x .7854.

The capacity of circular tanks in gallons is the area of the base in square inches (diameter squared x .7854) multiplied by height in inches and divided by 277.464.

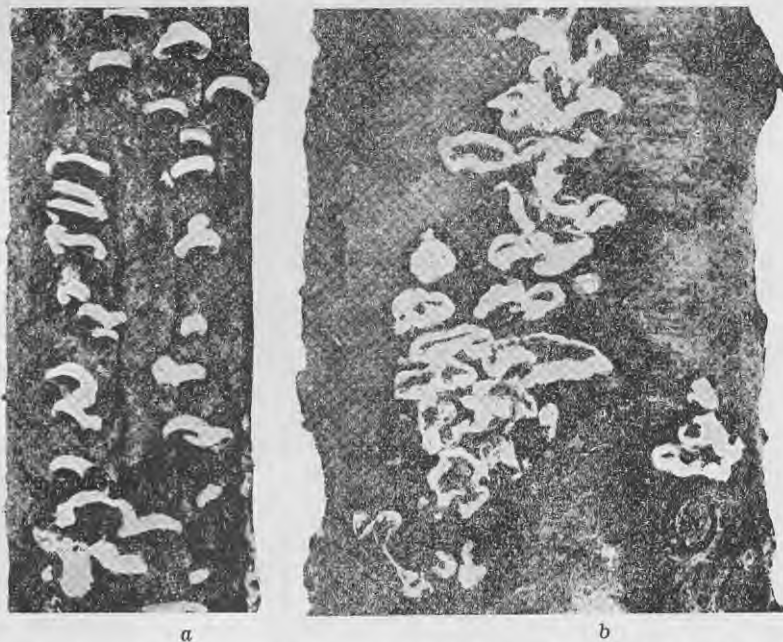


Fig. 8—*Stereum purpureum* Pers. a, on a willow branch; b, on the trunk of a living peach tree. Two-thirds natural size.