

season advances, increasing in size to such an extent as to encircle the stem. All the growing parts of the plant thus being affected, the cane usually withers and dies before fruiting.

Diseased plants have small buds and unhealthy looking leaves. The vegetative portion of the fungus penetrates the intercellular spaces of the host plant and robs it of its food material. The disease reproduces itself by means of summer spores which are distributed by natural agencies, and it is probably carried through the winter by means of the vegetative portion or mycelium of the fungus, which is supposed to be of a perennial character.

In the case of the black raspberry the characteristic blotches very often appear first at the base of the cane. The same general effect then follows as in the case of the red raspberry.

TREATMENT.

Experiments in treating this disease by spraying with Bordeaux mixture have been carried on during the last two or three years. It cannot be said to yield readily to this treatment, although it may be kept in check by spraying faithfully.

Prof. Green, of the Ohio Experiment Station, publishes the results of successful experiments in treating this disease and gives instruction for its treatment by spraying with Bordeaux mixture as follows:—

"The first application should be made early in the spring before the leaves open, at which time the spraying should be very thoroughly done. The second application should be made soon after the young canes appear above ground, and the spray directed to them alone. The third application is to be made about two weeks from the date of the second, taking the same precaution to spray the young canes principally. The fourth and last application should be made just previous to the time of blooming, in the same manner as advised for the second and third sprayings. Raspberry leaves are very tender, and the mixture may injure them slightly, but not enough to preclude its use, especially if some care is taken to keep it off the leaves of the bearing canes. The leaves on the young shoots of the current season's growth are not so easily harmed, hence no pains need be taken to keep it off them."

Mr. Green also reports good results from the use of ammoniacal copper carbonate solution, stating that it can be used "with even less harm to the foliage, but, all things considered, the dilute Bordeaux mixture is preferred." It is advisable to cut out and burn all fruiting canes each summer as soon as the crop is gathered.

ORANGE RUST.

Another troublesome disease affecting blackberries, however, more than raspberries is known as the "Orange Rust," (*Uromyces nitens*). The following description of the disease is given by Dr. Clarence M. Weed, in his work on "Fungi and Fungicides."

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