Control of Diseases and Insect Pests in the Vineyard

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IN common with other plants grown for commercial purposes the grapevine is subject to attack from a number of diseases and insect pests and a knowledge of them and of the specific control measures to apply is most essential for successful culture. This article describes the characteristics of the various diseases and insect pests of the vine which exist in New Zealand and prescribes measures for control.

THE degree of immunity to troubles varies with the variety of vine and its constitutional health. In general, American vines, especially those close to the elemental species such as are used for phylloxera-resistant stock, are somewhat more resistant than European varieties, but individual varieties of both types show considerable variation in this respect. The resistance of most of the hybrid types depends largely on the ratio of American to European parentage in the cross and upon the individual resistance of the varieties involved. Two of the commonest fungous diseases, oidium and downy mildew, are indigenous to America; it is understandable, therefore, that American vine types have acquired a certain degree of immunity to them. Phylloxera, the insect most destructive to European vines, also originated in America and many American varieties are completely immune to serious injury from this pest.

Both weak growth and soft, rank growth are less resistant to damage from fungous diseases and insects than strong, normal growth. A weakened condition of the vine may result from several causes—excessive cropping, inadequate or faulty nutrition, poor drainage, a too-acid or too-alkaline state of the soil, etc. Soft, rank growth is likely to occur in rich, moist soils having an abundant supply of nitrogen; such soils are often deficient in potash and phosphate, so that nutrition is unbalanced.

Another factor conducive to disease is poor air circulation in the vineyard, which produces pockets of stagnant, humid air and delayed drying of the foliage and fruit after rain. Proper trellising and training of the growth to prevent congestion, improve air circulation, and facilitate penetration of sprays was dealt with in the article "Trellising and Pruning Grape Vines", which appeared in the July, 1948, issue of the "Journal". Unrestricted weed growth beneath the trellis, which impedes ground draught, and a too-dense shelter belt also result in poor circulation of air. The maintaining of the vineyard free of weeds during the growing period of the vine also helps in the reduction of insect pests.

It is important to remember that good general management of the vineyard, which includes observing the precautions already outlined, plays an important part, in conjunction with spraying, in achieving satisfactory control of disease and insect pests.

In spraying for control of disease it should be remembered that the action is more valuable as a preventive than as a curative, for once the fungus mycelium has entered the tissues of the vine it is beyond reach of fungicides.

Downy mildew on the under side of a leaf.

All fungous diseases of the vine are encouraged by warm, moist conditions. In Auckland and areas north of Auckland these conditions prevail to a considerable extent in most seasons and to achieve effective control spraying has to be done at 2-weekly intervals at least throughout most of the growing period. This frequent spraying is necessary to put a protective covering of fungicide on the new growth the vine is continually making and to replace previous spray deposits washed off by rain. In Hawkes Bay and other parts with a less humid climate fungous diseases are not so prevalent.

The action of a fungicide is to destroy the spores or "seed" of a fungus before or soon after germination and thereby prevent the germinating tube from gaining entry into the tissues of the vine. The efficiency of a spray depends mainly on the completeness with which all the herbaceous or green parts of the vine are covered, and for mature, vigorous vines in full foliage about 100 gallons of spray per acre is needed to do a thorough job.

Fungous Diseases

Downy Mildew

Downy mildew appears first on the upper surface of the leaf as a discoloured, irregular patch of slightly paler and more transparent hue than the rest of the leaf; hence the French term for it "oil spots." Downy mildew also attacks growing shoots and bunches.

In moist conditions the under surface of the patch becomes covered with a dense white down. This is rarely seen on the upper surface of the leaves and not often on the shoots or flowers, but it is not unusual for the fungus to attack the fruit. If berries are attacked early in the season, the flesh