

INSECT PESTS IN THE VINEYARD

surfaces of vine leaves and produces characteristic blisters on the upper surface, a condition known as erinose. Under these blisters, from where the leaves are punctured, a white felty mass of hairs is developed. Erinose is rarely serious to the vine or crop; it has sometimes been confused with downy mildew by untrained observers.

Control: Treatment should be the same as for powdery mildew. As the mite hibernates under bud scales, a 1:10 lime-sulphur spray at the dormant stage is an active deterrent.

Borers

The activity of borers is confined mainly to the older wood of the vine, where its presence is indicated by a gummy exudation and an accumulation of wood crumbs.

Control: It is often possible to destroy the insect by probing the tunnel it has made with a piece of baling wire. If the insect is beyond reach, it may be asphyxiated by inserting a cotton-wool plug saturated with petrol, kerosene, or carbon bisulphide in the borer hole. Another method is to inject one of these chemicals into the hole with an oil can and plug the opening with a piece of clay or grafting wax.

Grapevine Weevil

The grapevine weevil can cause considerable damage by eating the leaves, shoots, and bunches. The beetles are very numerous when the growth is tender, but become less evident as the fruit and wood ripen or mature. Where stalks have been chewed the scars surrounded by dead tissue somewhat resemble—on casual observation—damage by black spot. As the beetles eat mainly at night and hide beneath old bark and twine and in other places during the day, they are not seen readily.

Control: Arsenate of lead or D.D.T. should be used as recommended for destruction of caterpillars.

Root Eelworms

Instances of damage to vine roots by eelworms have been rare in New Zealand. The roots are penetrated by the nematodes, which cause swellings somewhat similar in appearance to those formed by phylloxera infestation, but usually much larger and softer. As the eelworms are about 1/100in. long, they can be seen only with a microscope. Excessive moisture and high soil temperatures favour the pest.

Control: Improved drainage will sometimes help. Injection of the soil with carbon bisulphide (½oz. per square yard) has been effective when done in October, as at this time eelworms are moving about in the ground. Some stocks such as *Riparia gloire* are fairly resistant to eelworms.

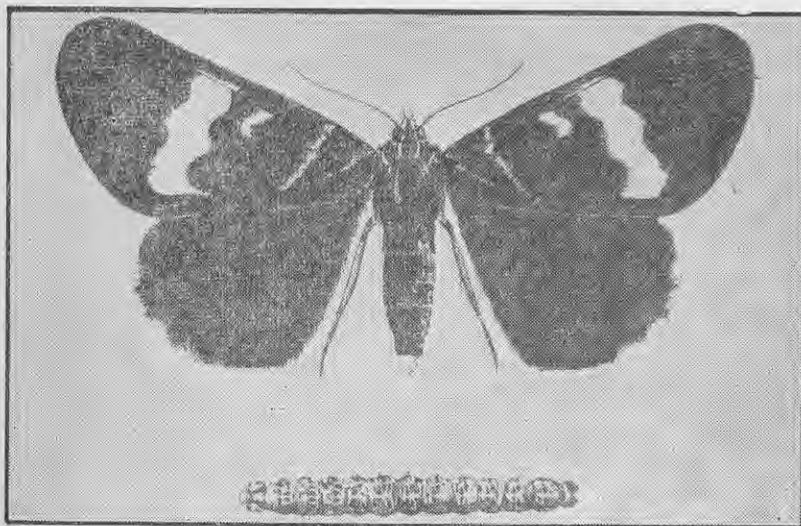
Brown Beetle

The brown beetle, which is about ½in. long is the adult of the New Zealand grass-grub. The beetle is on the wing at dusk during November and early December and is capable of causing considerable damage by feeding on the foliage of the vine.

Control: The same sprays as those used for grapevine moth should be employed.

Lecanid Scales

Lecanid scales are brown, elongated, oval structures up to a ¼in. long which



[After Given.]

Grapevine moth and caterpillar. The moth, which measures about 2in. from tip to tip of expanded wings, has yellow markings on the forewings. The end of the abdomen and part of the legs are reddish. The caterpillar, which is about 2in. long when full grown, is greenish-yellow and patterned with black lines and spots. The head is yellowish and the hind end reddish.

adhere to the woody parts of the vine and live by sucking the sap. If sufficiently numerous, they will seriously debilitate the vines.

Control: Apply lime-sulphur 1:10 or winter oil 1:25 at the dormant stage. Vines in foliage may be

sprayed with summer oil 1:100, if this treatment appears necessary, but the most effective treatment is to spray with winter oil at the dormant stage. The writer has never seen scale where lime-sulphur 1:10 is applied as a routine practice each year just before bud burst.

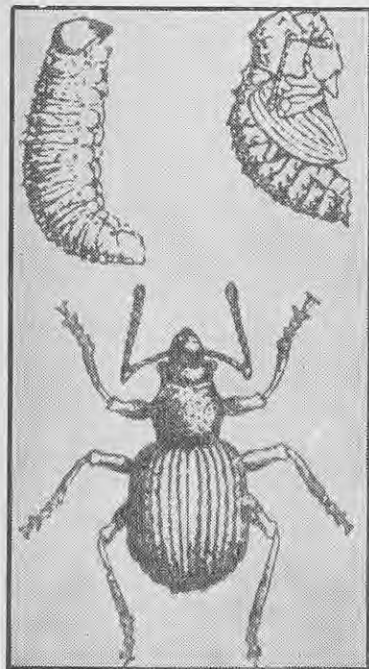
Degenerate Vines

Degeneracy is a physiological disease which may result from a complexity of causes, but in most cases continuous overcropping and improper nutrition are responsible. Affected vines weaken and die unless cultural methods are improved. In France a disorder similar to degeneracy, known as court noué, has reached serious proportions and intensive research work is in progress to remedy and prevent the trouble. The symptoms of Pearce's disease in California are identical with those of court noué, but investigators in California are of the opinion that the former is a virus disease. Until recently most French authorities regarded court noué, too, as a virus disease, but that view is now being superseded by the opinion that court noué is a nutritional disorder.

Spraying Schedule

The incidence of disease is related to climatic conditions, which vary with the locality and the year. For that reason it is not possible to formulate a spraying schedule to apply generally and the following should be modified to suit the circumstances:—

1. Just before bud burst spray the entire structure of the vine with 1 gallon of lime-sulphur in 10 gallons of water.
2. (a) When the shoots are 2 to 6in. long spray with Bordeaux 2:2:40, into which has been mixed colloidal sulphur at the rate of 2lb. per 100 gallons, and repeat



Stages in development of the grapevine weevil. Upper left—Larva. Upper right—Chrysalis. Lower—Mature weevil (actual size 9mm.).