

In Vermont, Mr. Harold L. Bailey, Assistant Entomologist in charge of insect suppression, states that the northernmost infestation consists of two orchards in the Champlain Valley which supposedly became infested from nursery stock in 1901. These orchards have not been sprayed except spasmodically until this year. Mr. Bailey says: "The fact that the insect has not apparently spread to any trees outside the orchards into which it was originally brought seems to show that no rapid spread is to be looked for in this district." He states that in the lower and thus warmer part of the state it is spreading much more rapidly.

In New York some of the fruit-growing districts are badly infested with scale, but Dr. Felt, the state entomologist, says that in some of the colder parts the scale seems unable to make any headway. One colony at Lebanon Springs that was apparently thriving ten years ago has practically disappeared to-day.

In Minnesota, Prof. Washburn states: "It evidently cannot survive our severe winters." He has tried rearing it out of doors, but after a few years it perished.

In Michigan, Prof. Pettit tells me that conditions are approximately the same as in Ontario. The scale is abundant in the warmer districts corresponding to our badly infested counties, but outside of these is rarely found. He says: "My belief is that the scale will grow almost anywhere, where peaches will fruit, but that it will not stand a colder climate than that required for peaches. This does not mean that peaches will grow successfully in a commercial way, but where they will grow some kind of fruit that can be called a peach."

In Idaho, Prof. Aldrich has given a good deal of attention to the effect of climate upon the scale, and has described to me a very interesting case. He says there is a valley situated about 700 feet above sea level. The land to the north of this rises up rapidly, and at a distance of three miles the average elevation of the country is about 2,600 feet. This height is maintained for at least 30 miles back. In the valley tender fruits flourish; on the heights the hardier fruits. In the valley the San José scale has thriven for 25 years; on the high land it has never been able in all that time to become established.

Dr. Aldrich is inclined to think that it is not the occasional dropping of the thermometer in winter to a very low point that is the important factor in determining the natural control of the scale in a locality, but rather the total number of hours during the summer when the temperature is above 80° or perhaps even 90°F. In the valley referred to, in which the town of Lewiston is situated, he says he feels sure that there are five times as many hours of maximum temperature from 80° to 90°F or upwards, as at Moscow on the higher land thirty miles away. By "optimum" temperature is meant the temperature at which the scale thrives best and reproduces most rapidly.

(3) By reading Dr. Marlatt's account of the distribution of the scale in 1906 as given in bulletin 62 of the Bureau of Entomology, Washington, D.C., and comparing this with the present distribution in the northern states and Ontario, one sees that since that date the pest has spread northwards only to a very limited extent.

(4) In the northern districts there is a gradual lengthening of the winter, and also a longer period of humid, wet, alternately freezing and thawing weather in spring and fall, both of which have an unfavorable effect upon the scale. Now we know that ordinarily less than 50 per cent. of the scales come through the winter alive even in the Niagara district; we should look therefore for a much smaller percentage in a climate like Guelph, and a still smaller in colder and more moist

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