

The life history of the red spider is very interesting.

The spinning mite of the hop plant passes the winter in the perfect state under stones and clods, in the bark of trees, and in the clefts and under the dried rind of hop poles. It is not noticed, at all events in numbers or as actively injurious, unless there is at least normal summer-heat, and it only multiplies in a dangerous degree when the day and night temperature are abnormally high. In such circumstances the increase in its numbers and its destructive influence are remarkable. Eggs are abundantly laid and, as above described, fixed in position by threads. The comparatively large and round egg is pellucid white at first and finally becomes slightly dark-coloured. The mites emerge from the eggs in five or six days, and at once begin to suck up the juices of the leaves. At first they are pale greenish-yellow in colour, with dark patches on both sides of the body; they become more tinged with yellow later, and some very light brown specimens have been found, but in no case have they been seen of a distinctly red colour.

In the earlier stages of their existence the mites have only three pairs of legs, but the full grown insect has four pairs. There are two stiff hairs upon each joint of the legs, and the claws are furnished with long, stiff hairs, upon the ends of which, or upon some of them, are little round balls, or pads, supposed, "to be an essential part of the spinning apparatus." The head is provided with a stout pair of mandibles with hooked ends for biting into the tissues of the leaf, and the mouth has a sucking apparatus which is inserted into the tissues. Very far behind the head are the red eyes. On the under side of the mite, towards the end of the abdomen, there is a "conical nipple," "from which the threads of the web are drawn up and guided by the motions of the mite and by the action of the minute claws and hairs of the legs." Mites left on the leaves upon the plant retire into the cracks and under the rind of the poles; they have great power of locomotion, and travel very rapidly quite independently of their webs.

Modes of prevention and remedies.

It is most difficult, and it may be said almost impossible, to prevent these spinning mites from getting on the bine and leaves. They are most agile in movement, and travel up the bine rapidly.

Plants on wire and string seem equally liable to attacks, as the mites crawl the bines. The application of caustic substances close round the hill is ineffectual, as the mites are so tiny that they would not be affected by such material as lime, gas-lime, or kainit unless reduced to the very finest powder. It would also be impossible to get at the mites in the cracks of the poles and posts for wire work. When a drought commences in June and there is a probability of its continuance, it would be useful to immediately syringe hop plants upon which the mites are seen with cold water, or with water, soft soap, and sulphide of potassium, before the webs are made or before they are plentiful and thick. The syringing must be heavy and frequent, mere spraying will not suffice, as it is well known that the ordinary spraying with quassia and soft soap has a very slight influence upon them. Hop plants that have been sprayed three or four times for aphid-blight have yet remained badly infested by these mites. To be effectual, syringing must be done early, vigorously, abundantly, and with hand machines. When the webs are well established, even the most drastic syringing is often unsuccessful.

Sulphuring, that is applying "flowers of sulphur" by means of a horse machine which blows the fine particles on and under every part of the hop plants, is supposed by some to have a prejudicial effect on the mites, but it is believed that this is of little if any benefit. Hop plants are sulphured almost in the ordinary course of cultivation, but the mites are not hindered by this in the least degree. Leaves have been examined upon which the webs of the mites were thickly covered with particles of sulphur, and the mites in the webs immediately in contact with the sulphur were lively and unconcerned. Paraffin emulsion has been of considerable effect when used in the early stages of the attack. This is made by mixing 6 lbs. of soft soap and 7 gallons of paraffin with 100 gallons of water and poured into a tub containing the paraffin, the whole being churned up with a force pump. The mixture is afterwards diluted to the proper strength. It is important that the water used for this emulsion should be soft; it can be made soft by adding soda or borax.

Sulphide of potassium, known commonly as liver of sulphur, the foundation of several washes for insects, has been used with considerable ad-