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W. A. alert for aphid on lucerne

by the Entomology Branch

The spotted alfalfa aphid which is devastating lucerne crops in the Eastern States, could be introduced to Western Australia on lucerne hay which is fed en route to imported livestock. The Department of Agriculture has therefore alerted all inspection points about the possible danger.

The spotted alfalfa aphid (Therioaphis trifolii) has a drastic effect on Hunter River lucerne, and has completely defoliated Eastern States crops within a few weeks. Even a light infestation will kill seedlings.

If the spotted alfalfa aphid becomes established in W.A., lucerne growing may become uneconomical for several years. The aphid can be controlled with expensive chemicals, but it would take several years for suitable aphid-resistant lucerne varieties to be made available, and other controls such as parasitic wasps to be introduced. The Department of Agriculture is maintaining traps specifically for the aphid at three sites, at Esperance and in the south-west, and has found no evidence of it yet.

Description

The spotted alfalfa aphid is a small yellow-green aphid and on the upper abdomen has four to six conspicuous rows of dark spots with spines. Adults are about 1.5 mm long. They will readily jump when disturbed.
The first signs of damage to a lucerne crop are yellowing leaves, and leaves dropping progressively from the bottom of the plant. Aphids first occur underneath the lower leaves, and then spread to the stem. This damage is caused not only by the aphids sucking the sap, but also by toxins which they inject into the plant. The aphids leave excess sugars on the plant, and sooty mould grows on this. Therefore, when damage to the lucerne is severe, only black sticky stems remain.

**Biology**

Aphid numbers can increase quickly in favourable conditions. The young female can mature in six days and produce young without mating. Each female produces three to six nymphs a day and, during its lifetime of a month or two, may produce up to 140 young. In favourable climates there may be 30 to 40 generations a year. The aphid is well adapted to hot dry conditions, and in fact prefers them. Too much rainfall can check aphid numbers by slowing their development and by promoting the growth of a fungus which can kill them. The aphid can develop and reproduce provided that daily temperatures average more than 6 deg. C and less than 33 deg. C, the most favourable being between 26 and 29 deg. C. Winged forms of the aphid fly only weakly, but can be spread rapidly and over long distances by wind.

**Host plants**

In overseas countries, the spotted alfalfa aphid has been mainly a pest of lucerne. Some varieties such as Hunter River, are more attractive to it than others. However, the aphid also attacks annual medics, and recent tests in South Australia have shown that most commercial varieties appear to be susceptible in the glasshouse. The spotted alfalfa aphid can also feed and reproduce on some clovers such as crimson and strawberry, but will probably not cause much damage. Subterranean, red and white clovers are not attacked.

**Resistant cultivars**

The spotted alfalfa aphid first appeared in the U.S.A. in 1954, and resistant cultivars (varieties) suitable for the U.S.A. have been developed. With such cultivars and other controls, the losses caused by the aphid have been reduced to about 10 per cent of the losses when damage was at its peak. Lucerne cultivars already in Australia are being tested for resistance to the aphid. The cultivar Falkiner which has been recently released in the eastern states for its suitability for wet heavy soils, has been found to be resistant to the aphid.

Falkiner is being bulked up as quickly as possible, but only a small amount of seed is available (150 kg) and its degree of resistance needs to be further assessed. In case of delay in Australian grown seed becoming available in commercial quantities, seed of potentially suitable cultivars will also be imported from the U.S.A. However such seed will be subject to the usual stringent quarantine procedures.

Australia will also try to develop its own suitable cultivars of lucerne, both from resistant U.S.A. parents, and from any Hunter River plants which show to be resistant in damaged crops.

**Controls**

The U.S.A. has developed methods of control of the spotted alfalfa aphid using a fungus disease which can kill them, and a wasp which is a parasite on the aphid. This wasp lays its egg in the aphid, and the developing larva kills the aphid. The parasitic wasps have been imported into Australia, and will be bred for possible release in the field.

Reports also indicate that insects already in Australia, such as ladybirds and lace-wings, are helping to control outbreaks of the aphid. The CSIRO will make a search in Australia for any fungus which attacks the spotted alfalfa aphid and other aphids. If such fungi are not already in Australia, the fungi known to attack the aphid in the U.S.A. will be imported. Techniques for spreading the fungus will then be investigated.

**Other aphids**

Another aphid species known as the blue-green aphid, Acyrthosiphon kondoi, has been found in Queensland and New South Wales. This aphid is a cool season pest, unlike the spotted alfalfa aphid, and has caused serious losses in the U.S.A. It has also become established in New Zealand.

A third aphid pest present in the U.S.A. and New Zealand is the pea aphid, Acyrthosiphon pisum. These other pests will also be considered while controls and resistant varieties are being investigated for the spotted alfalfa aphid.

**Chemical control using insecticides**

Chemical control using insecticides such as dimethoate, demeton-S-methyl and monocrotophos will control the aphid, but costs range from $5.00 to $6.00 a hectare and can only be considered for seed production. In some instances, local insect predators have greatly reduced aphid numbers in unsprayed infestations.