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GORSE SPIDER MITE

Background

Gorse is one of the most serious agricultural and environmental weeds in Tasmania. Because of its invasiveness and the difficulty and expense of controlling it by conventional methods it is seriously affecting the resilience and sustainability of the land on which it is established. It is of particular concern in agricultural areas, riparian environments and in disturbed areas of bushland. Infestations occur on rural land in all parts of Tasmania. The heaviest infestations covering *ca.* 30,000 ha. occur in the central and northern midlands on pastures grazed mainly by sheep. In these areas alone, losses in animal production are currently estimated at *ca.* $1 million per annum.

Biological control offers a long-term solution to the gorse problem and the chance of returning land to sustainable and productive use through an environment friendly control system. The possibility of a biological control for gorse is not new and began with the introduction of the gorse seed weevil from England. The weevil was released in New Zealand in 1931 and in Tasmania and Victoria in about 1939. Although now widespread it has had no appreciable effect on gorse as it only attacks the spring crop of seeds, with the autumn crop being completely unaffected.

Several other biological control agents that attack gorse in their native environment of Europe have since been introduced into New Zealand and the United States. These include the gorse spider mite, *Tetranychus lintearius* Dufour, which is the most damaging agent on gorse in Europe.

The gorse spider mite, which was found to attack only gorse, was originally imported into New Zealand from England in 1988. It was first released in New Zealand in 1989 and is now widespread there. Gorse spider mite was re-assessed for its host specificity to make certain that it will only attack gorse if released in Tasmania or elsewhere in Australia. As a result of these tests, the mite was imported into Tasmania and Victoria in spring 1998 to enable mass rearing programs to commence in these States. In Tasmania, the first field releases commenced in December 1998. Since then, the mite has now become established on all gorse infestations throughout Tasmania.

Description

Gorse spider mites range in size from about 0.4-0.6 mm in body length (smaller than a pin head). Immature mites have green abdomens with mouthparts and legs ranging from orange to yellow. On maturing the body reddens often with a dark spot on either side of the abdomen.

Biology

Gorse spider mite forms discrete, long lived colonies (Fig. 1) which live in a tent-like white web and move around the host plant en masse feeding and web spinning as they go. These colonies feed on mature gorse foliage.

Figure 1. *Gorse spider mite webbing on gorse (Photo: R. Holloway, TIAR)*

The life cycle is temperature dependant and takes *ca.* 46 days at 15°C, *ca.* 32 days at 20°C and 20 days at 23°C. Because it is able to pass through

several generations in a relatively short time at warmer temperatures it can quickly build up in large numbers.

The mites pass through 6 immature stages before the adult stage is reached. Adults may feed from 1-2 weeks before the female starts egg laying. Eggs, which are brownish when mature, are scattered through the silk webbing of the colony and hatch in 1-2 weeks under warm conditions. In summer, each female lays *ca*. 40-50 eggs at the rate of 1 per day to a maximum of four per day, depending on temperature. The sex ratio is 1 male for every 20 females, although this can vary considerably. Climatic conditions, particularly rainfall, have a direct impact on the establishment and population growth of the mites. On warm days they can be seen moving actively through their webbing, however, on cold or wet days they protect themselves by clustering at the centre of the web, often on the leeward side of the gorse stems.

Damage to gorse

Gorse spider mites have sucking mouthparts with jaws like hypodermic syringes that pierce the plant cell wall and extract the cell contents. This ultimately results in the foliage having a bleached or bronzed appearance. Mite feeding can significantly reduce the green weight of a gorse bush and can reduce flowering and retard growth.

Prospects for control

It is expected that the gorse spider mite will be one of several agents that will be required to collectively reduce the vigour of gorse. Releases of the gorse thrips, *Sericothrips staphylinus* Haliday, in Tasmania commenced in January 2001 and are continuing at sites around the state. Another biological control agent, the gorse soft shoot moth, *Agonopterix ulicetella* (Stainton), was approved for field release in 2005 following the completion of tests that showed that it was host specific to gorse. The larvae of the gorse soft shoot moth, attack young gorse foliage. Releases of this agent are expected to begin in 2006. If this agent can also be widely established, its effects will compliment those of the gorse spider mite, the gorse thrips and the gorse seed weevil. Other biological control agents are also being investigated.

It is important to remember that biological control will not eradicate gorse but it is hoped that the combined impact of complementary agents could significantly reduce plant vigour, making gorse more susceptible to grazing, weather stresses and herbicides.

Vigour reduction of gorse would enable beneficial plant species to compete with it more readily resulting in a substantial increase in pasture and animal productivity in agricultural areas. The control of existing gorse stands would become economic and gorse regeneration in existing or renovated pasture or conservation areas would be retarded or cease. The spread of gorse would also be restricted due to a greatly reduced seed output. There will also be a reduction in the use of gorse as a habitat for vertebrate pests, and it will be reduced as a fire hazard

Traditional control methods, at much lower levels and therefore lower costs, will be integrated with biological control methods.

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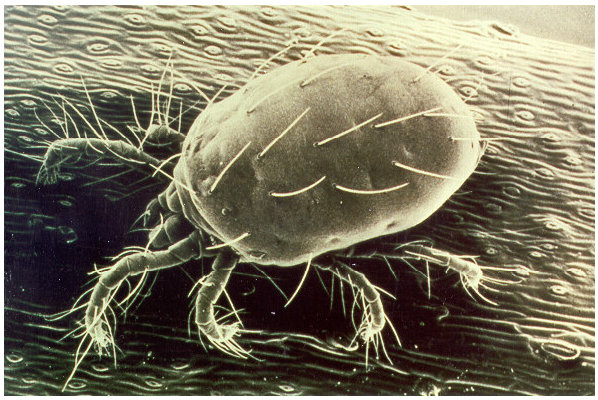

Fig. 2

Fig. 3

Fig. 4

Figure 2 Adult of the gorse spider mite, Tetranychus lintearius, under high magnification (Photo courtesy of Landcare Research New Zealand Ltd.).

Figure 3 Formation of colony and protective webbing of gorse spider mite (Photo courtesy of Landcare Research New Zealand Ltd.).

Figure 4 Attacked gorse plant showing webbing, and distinct decolouration of foliage due to feeding of gorse spider mite (Photo: R. Holloway, TIAR).