Combating Clover Root Weevil

Having a high proportion of clover in your pasture increases overall pasture quality and nitrogen fixation. There are a number of threats to clover including shading by grass, over grazing, low soil fertility, clover flea and nematode. This R&D Brief covers another threat to clover persistence and growth - the Clover Root Weevil (CRW).

WARNING! Clover Root Weevil is spreading south...

Upper North Island  
Discovered Waikato 1996  
Lower North Island  
Hawke’s Bay 2004  
Manawatu 2004  
South Island  
Any time soon...

Meat & Wool New Zealand is investing farmer levies into finding ways to reduce the impact of this weevil. The key targets are -

• To release a parasitic wasp onto New Zealand pastures to control CRW, by 2006
• Give advice to farmers’ on how to encourage clover growth and persistence through good establishment, grazing and fertiliser practices

(1) What happens to my clover?

‘You see notches on the clover but the real problem is underground.’

Understanding Clover Root Weevil –

• Prefers medium to high rainfall areas
• Prefers white clover but will feed on leaves of other clovers
• Larvae feed on clover stolons, roots and nodules so reduces clover’s ability to fix nitrogen
• Adults can fly. They live in the soil surface and climb clover plants to feed. They produce ‘U’ shaped notches on the leaves
• Development from egg to fully-grown larvae takes about eight weeks
• Can survive in baled hay
• Highest population in spring and autumn, especially following wet summers
• Research shows some white clover species or cultivars may be more tolerant to attack (e.g. Kopu II)
• Can totally wipe-out clover

‘Only skeleton of clover remained,’ says farmer

Bruce and Sally McGregor were one of the first Hawke’s Bay farmers to spot CRW on their farm, 30km inland from Napier.

“In one bad patch only skeletons of the clover plant remained. Outside the area we saw notching damage,” says Bruce.

Less obvious but very damaging to production is the destruction of clover nodules underground by larvae.

“We saw very peaky growth patterns in the pasture, yellowing leaves and obvious pasture growth in urine patches.”
“We have increased nitrogen (N) applications to sustain grass and clover but the sums don’t always stack up in our beef and sheep situation.”

The McGregor’s have altered their fertiliser spend since the CRW arrived. “We cut phosphate back from 50 to 30 units and spent the extra money on N.”

“We need more information on using N efficiently on sheep and beef pastures affected by the weevil.”

“Some farmers in the area have had to apply N just to help stop reversion to undesirable pasture species.”

As well as running a bull beef unit at Patoka, Bruce is a farm consultant.

(2) What can farmers’ do?

‘Notches’ in the clover means you have CRW. Seek advice on management.

Avoid sowing clover in spring. Put pasture into a spring crop (maize or brassica) and sow permanent pasture in autumn to improve clover establishment in weevil-affected areas.

If CRW is present on your farm, apply chloropyrifos (e.g. Lorsban 48EC 750 WG insecticide) before sowing new pastures. This reduces the chance of damage to young seedlings by adult CRW.

Killing the weevil with insecticide is not a long-term option, as the weevil will quickly re-infect the area from other ‘non-sprayed’ areas.

Waikato farmer: “We had great clover after a wet summer in 2001. But next winter we saw the pasture yellowing and knew something was wrong. Despite clover being there it wasn’t fixing N.”

Give your white clover the best chance by -

• Avoiding over grazing (i.e. 1000kg DM or 2cm) especially when very dry
• Keep grass cover less than 2500kg DM/ha (around 10cm) so grass doesn’t smother clovers
• Cautious use of herbicides to control thistles as herbicides can be harmful to clover

Fertiliser recommendations -

As the weevil reduces clover’s ability to fix N, N may need to be applied to maintain both grass and clover production. Farmers have found that applying N in small doses (10-20 units N/ha) helps boost clover without encouraging grasses to over-dominate and shade clover. Graze before grasses shade clover.

(3) High hopes that Irish wasp will ‘rein-in’ weevil

Since 1997 Meat & Wool New Zealand, together with other funders, have been looking at biological control methods. Research is showing that a parasitic wasp from Ireland (Microctonus aethiopoides) has the potential to control CRW numbers.

As the wasp does not need males to breed, there is no risk of it inter-breeding with other species currently in New Zealand. Over the past twenty years, Microctonus species have helped suppress pasture pests in lucerne and ryegrass.

“The wasp should keep weevil populations at levels that have minimal economic or environmental impact on farm systems.”

Dr Pip Gerard, lead scientist for the CRW programme.

When can we expect release?

Scientists have applied to ERMA to have the release of the new species approved. All going well, the wasp could be released on trial sites in the Waikato, Hawke’s Bay and the Manawatu in late 2005. Research will be needed to see if the parasitoid will spread un-aided from a few sites. Otherwise many releases will be needed.

Another research project (FRST-funded with Ballance Agri-Nutrients) is looking at the possibility of a fungal disease that affects the weevil and other insects. It will be several years before this product is ready for commercial release.

Work is also being done to find an ‘attractant’ to lure CRW into traps.

Why is this research important to farmers’ back pocket?

Research has shown that increasing the legume content of pasture from 10% to 45% can double lamb growth rates. Early identification means farmer’s can alter management. A survey of Hawke’s Bay and Wairarapa (Meat & Wool New Zealand FITT project) showed that the weevil was becoming widespread in these areas during summer 2004/05.

Acknowledgements & more information

For more see http://www.hortnet.co.nz/publications/nzpps/journal.htm and enter clover root weevil in the search

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