Northland Pastoral Extension: Popular Summary

Insect Pests

Summary of Key Findings

Research work on insect pests in Northland during the 1970s and 1980s concentrated particularly on Black Beetle and Black Field Cricket.

- Pasture damage caused by these insects – Black Field Cricket is a far more serious pest than Black Beetle.
- Management – Black Field Cricket is much easier to control than Black Beetle.
- Recovering pasture after Black Beetle damage – application of Nitrogen is much better than pesticide for control of Black Beetle.

Black Field Cricket

Surveys in 1982 and 1983 showed consistently high Black Field Cricket (Cricket) population numbers for Northland. Medium to high Cricket densities resulted in *severe* pasture damage, reducing production by up to 2,000 kg DM/ha on high-producing dairy farms.

Cricket numbers are accurately and readily determined by flushing Crickets out of the ground using a mild irritant.

Damage

Under medium to high Cricket densities, severe pasture damage results from:

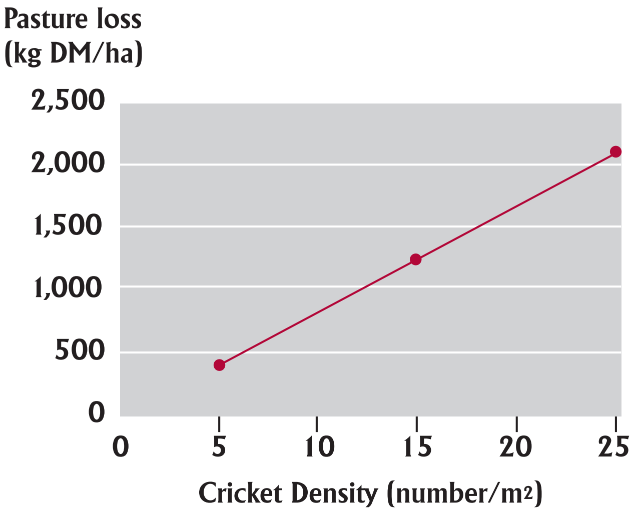
- Loss of pasture growth.
- Death of pasture species (eg: ryegrass).
- Loss of pasture seed.

Weed invasion occurs as a result of all the above factors.

Densities of Crickets were high to very high in the late 1970s and early 1980s.

As Cricket populations increased, so did pasture losses – especially during dry summers (when feed is already short), resulting in up to 50% of pasture being destroyed.

Susceptible soils were those that cracked during a dry summer (eg: clay flats).



Northland Surveys

A combined aerial, ground and postal survey conducted in 1982 showed that over 80% of the Kaipara clay flats in the Ruawai-Dargaville area were infested with high numbers (>10/m^2) of Crickets.

Farms with a known history of Cricket baiting were lush and green, in contrast to those of neighbours who had not baited. Dairy farmers who baited held milk production to levels of previous years; farmers who didn't bait had greatly reduced production.

Cricket bait made of 10 kg of grain (wheat, barley or cracked maize) mixed with 250 mL of Maldison (Malathion 50% EC).

A survey in 1983 showed Cricket population numbers in Northland of 65/m^2. In response to these densities, plus an effective extension programme promoting control of Crickets using treated bait, purchase of Cricket bait was 950 tonnes in 1983 – compared with an average of 54 tonnes per year for the previous four years.

Control Benefits

The value of pasture saved by Cricket baiting throughout Northland in 1983 was estimated at $7.1 million.

Pasture losses from Crickets of up to 2,000 kg DM/ha on high-producing dairy farms occurred.

Using current (2005) prices, this would be a loss of up to $500/ha.

Estimating Cricket Numbers

An easy, accurate method for estimating Cricket numbers was developed, particularly suitable for assessing Crickets early in the summer (eg: first weeks in January) – the most effective time of control.

During a dry summer, large amounts of pasture can be destroyed *before* Crickets are recognised as a problem.

- Baiting in early January gave 90% control of potential damage.
- Baiting in mid-March gave just 25% control of potential damage.

Crickets need to be flushed out of the ground, as up to 90% of them are hidden in cracks in the soil during the daytime.

Flushing Technique

An irritant flushes Crickets out of cracks to the soil surface where they can be counted. (If the irritant is spread over a known area, density estimates are obtained.)

Irritant

Weak pyrethroid solution – 0.4 mL of 'Ripcord' 40% EC *or* 7 mL 'Decis' 2.5% EC in 10 litres of water

or

Weak detergent solution – 4 mL of 'Tepol' (dishwashing liquid) in 10 litres of water

↓

Pour solution down crack

↓

Count crickets as they are flushed out

Black Beetle

Paspalum, kikuyu and cocksfoot are tolerant to Black Beetle (Beetle); phalaris is resistant; other common grass species (eg ryegrass) are susceptible to Beetle damage.

Even moderate Beetle densities caused little overall damage to pasture.

Insecticide control is *not* a practical means of increasing pasture production before or after Beetle damage – but the strategic use of Nitrogen is.

Damage to Pasture Species

A decade of monitoring (1970s and 1980s) on sandy soils near Dargaville showed no pasture damage or drop in pasture production from Beetles, even for moderate densities (up to 40/m^2 in ryegrass, up to 77/m^2 in kikuyu).

Changes in Beetle numbers and their effects on recently-sown pasture species were measured near Helensville in 1975–1978. The Beetle population, at potentially damaging levels of 45/m^2 in the first year, fell away to low levels due to unexplained beetle deaths November–Feburary the next year, and then remained at zero or insignificant levels for the rest of the monitoring period.

Black Beetle Control or Nitrogen Use?

The strategic use of Nitrogen to recover pasture production *after* Beetle damage proved to be far more practical than chemically controlling the beetle *before* any damage was done.

Trial work was conducted on sandy soils north of Kaitaia in the mid-1980s.

Pasture responses to Nitrogen varied, depending upon time of year and pasture type, but were always very positive.

Pasture responses after insecticide applications were effectively non-existent.

Insecticides that control Beetles reduced pasture pulling in one of three years (in both ryegrass and kikuyu pastures), but this advantage was not transferred into an increase in pasture production.

AVERAGE PASTURE GROWTH FOR 3-YEAR TRIAL PERIOD (KG DM/HA/YEAR)				
Pasture species	Insecticide treatment	No insecticide treatment	Nitrogen applied	No Nitrogen applied
Rye dominant	10,280	10,070	10,395	9,175
Kikuyu dominant	6,710	6,923	7,350	6,150

Insecticide treatment resulted in an average:

- Increase in pasture growth for rye of just 2%.
- *Decrease* in pasture growth for kikuyu of 3%.

Nitrogen treatment resulted in an average:

- Increase in pasture growth for rye of 13%.
- Increase in pasture growth for kikuyu of 20%.

Beetle populations varied from low to high (11–27/m^2 on ryegrass pastures, 16–112/m^2 on kikuyu pastures).

Insecticide use resulted in 89% reduction in Beetle larval numbers, but any associated pasture response (apart from small, short-lived responses in growth, in December) was effectively non-existent.

Black Field Cricket or Black Beetle Damage?

Because of the ease and practicality of chemical control of Crickets (Maldison-treated grain bait) as opposed to that for Beetles (insecticide applied November to early December – before summer conditions are known; expensive; needs rain to be effective), it is essential to know which insect is causing the damage.

The symptoms of severe pasture damage by both insects are very similar – large areas of bare ground with 'stalky' grasses that fail to respond to autumn rains. Specifically:

- **Beetles – chew through the root systems of plants.**
- **Crickets – preferentially consume green leafy plants, but eat stems and roots in situations of severe pasture damage.**

During the 1982–1983 drought, many Northland farms suffered severe pasture damage, due to overgrazing by livestock and by insects. The drought enabled high numbers of insects to survive.

Eight farms, where Beetles were thought to be responsible for pasture damage, were investigated.

- Six farms on clay or semi-volcanic soils – low Beetle numbers, high to very high Cricket numbers (40–100/m^2).
- Two farms on sandy soils – moderate to high (up to 110/m^2) Beetle numbers, very low Cricket numbers.

Compiled by **Gavin Ussher**, edited by **Terry Bunn**.

A project coordinated by the Northland Pastoral Farming Development Group.

The unabridged versions of **Research Stocktakes – Insects Pests** is available on the Enterprise Northland website: www.enterprisenorthland.co.nz