

Grass Grub project 2012-13

The AgBoard in association with MPI and Beef + Lamb New Zealand

1. Milestone Summary Table

| Milestone Number | Milestone [As per SFF contract schedule] | Completion Date | | Percent Complete |
|------------------|---|---|---|------------------|
| | | Original | Actual | |
| 1 | Focus group farmers selected and given the understandings and knowledge required, as per project design. Project team meeting to confirm overall plan of events. First Field day on selected farm or farms with 30+ participants. Press release and field day invitations sent to several media outlets as per extension plan. | 31 Oct 12 | Most complete by 31 Oct. Rescheduled demo days complete by 30 Nov. (as per Milestone Report Nov 12) | 100% |
| 2 | Pheromone traps positioned on trial farms and assessed by trial farmers. Grass grub populations assessed overall by science providers. Demonstration trial organised from this information. | 28 Feb 13 (extension to 31 Mar as per 13.03 email) | This part completed by 30 Nov 12 This part – 31 Mar 13. | 100% |
| 3 | Pasture production, pasture composition and larval disease estimated on trial farms. Results written up and shared with media and others as per extension plan. Best practice advice bulletin written and distributed. Second Field day on demonstration trial farm <u>or farms</u> (variation requested in Apr13 report) with 30+ participants <u>overall</u> . Final report submitted to SFF. | 30 June 13 | This part – 31 Mar 13 These parts - 30 Jun 13 15 Jul 13 "Within two months" as above | 100% |

2. Project Objectives

We aimed to help address the issue of grass grub damage and its consequent limiting of farm productivity. The ability to grow quality grass/clover pastures is fundamental to the prosperity of individual farmers as well as maintaining New Zealand's export volumes. A moderate grass-grub infestation (300/m²) will cause a 20% production loss, while at higher levels pasture plants are destroyed, allowing inferior or non-palatable plants to invade, permanently reducing pasture

production and quality. Remediation with organophosphate insecticides often occurred after production losses are evident and too late to prevent permanent pasture degradation. In addition, the most effective chemicals, such as diazinon, may soon be de-registered because of concerns about safety. An alternative approach is to accept damage and renovate pastures more frequently, but this is expensive and energy demanding. We aimed to work with AgResearch, Ballance Agri-Nutrients and Beef + Lamb New Zealand to use recent research as to the best approach, to update farmers' thinking and provide some practical demonstrations for farmers to observe and consider in their own practice. So, in summary, the objectives were:

- to practically demonstrate to farmers a comparison of management techniques for grass grub, incl. an innovative biological control technology.
- to give farmers the knowledge and skills to predict grass grub damage potential and take the recommended action where necessary and where economically appropriate.
- to encourage an awareness of grass grub losses, the grass grub cycle and appropriate farmer action times - widely promoted and distributed through a new AgResearch brochure, events and the media.

3. Approach

Project farms were selected at Te Houka, Owaka, Hillend, West Otago, Clydevale, Hindon for a four stage process that neighbouring farmers were encouraged to observe and imitate.

Stage one happened in September – farmers assessed their last season's damage on a 1-5 scale and considered in which paddocks the next serious issues may arise. This requires an understanding of the grass grub beetle's life cycle and how land cultivation and dry summers can effect grass grub numbers. Colin Ferguson, scientist at AgResearch supported farmers.

Stage two involved observations during the brief mating and then feeding flights of the grass grub beetles around mid November to early December (this varies district to district). Colin set out pheromone traps to attract the beetles and gauge numbers on each of the six farms. We then offered demonstration days on three of our farms, 22-23 November, and had good discussions with three small groups of largely local farmers. Likely grass grub numbers in the trialled paddocks were assessed.

We followed this work up in February 2013 with Stage three and a second series of neighbourhood farmer meetings at four of our farms. At each property we dug spade-width squares to a depth of approx 20cms to find and count the larvae and grown grubs of *Costelytra zealandica*. AgResearch advice is that at 8 larvae per spade square (200/sqm), there is very likely to be widespread damage and a considerable economic impact. Just 3 per spade square in new pasture will cause the same problems. There is good information at these two websites:

http://pestweb.co.nz/view_species.php?sp=Costelytra+zealandica&tab=1

<http://www.pggwrightsonseeds.com/uploads/Forage%20Focus%20No%2014%20Grass%20Grub.pdf>

Unfortunately (only for the project, not for farmers) there was little serious grass grub damage across the district this season. At only two of our farms did we find damage that indicated some mitigation strategies were necessary this particular year. Stage four involved our science advisor working with these two farmers to try two significant management techniques and then demonstrate the results to farmer meetings in late autumn.

At our West Otago site three strips in a significantly grass grub effected paddock of 2x20 metres were treated: as a control with no treatment, with urea (nitrogen) and with diazinon (applied with prills and followed by a good 25mm of rain as is ideal).

At our Hindon trial farm one two year old paddock was selected for application of Bioshield, a commercial formulation of the naturally occurring grass grub bacterial pathogen *S. entomophilla*.

One ha was drilled with the Bioshield and one ha identified as a control. Grass grubs were counted at drilling on 3 April and then on 31 May and the effectiveness of the treatment estimated.

On 30 May 2013 at West Otago and on 11 June at Hindon we ran demonstration days to illustrate findings on these two properties and also give a focus to the current best practice process to cope with grass grubs. On the West Otago farm numbers of grass grubs after approx. 10 weeks of treatment were 380/m² on the control strip, 310/ m² on the urea strip, and 22/m² on the strip treated with diazinon. The value proposition for using the chemical was discussed – the value of the pasture ‘saved’ had to be put against the cost of the chemical. (More detailed explanations of these treatment trials is available in the AgResearch report on this project).

We ran two sessions of 11 then 24 farmers at West Otago and two sessions of 22 farmers then 11 at Hindon. (Flyers for the Hindon event attached; West Otago advertised in papers). The total of 68 far exceeded our expectations, especially for a year in which not so many farmers had large grass grub infestations.

A brochure “Best Practice for Managing Grass Grub” (Colin Ferguson, AgResearch) was also prepared for and distributed on these demonstration days. B+LNZ have also already made this available via their email communications and website. It will be incorporated into the AgResearch www.pestweb.co.nz website.

4. What were the main findings from this project?

Specific findings have been outlined above.

In general we hope farmers have learnt that:

- Farmers need to follow a sequence of observations to manage the inevitably variable year-to-year grass grub issue. This begins with observations in August/ September of residual damage from the previous year; then observations of feeding flights in November; then digging in February for likely late autumn onwards damage.
- The most effective management tool is still the diazinon chemical treatment according to our small demonstration trial, but farmers need to do the economics of spending this money on the basis of the observed likely damage for their pastures.
- There is further explanation and advice in the new short bulletin “Best Practice for Managing Grass Grub” (Colin Ferguson, AgResearch) and farmers should obtain a copy.
- Farmers have also been advised during this project to subscribe to the pestweb alert arrangements from pestweb.co.nz and that this is a resource worthy of looking at.

5. Where to from here – what are the next steps?

We expect to keep the project team together to make a further project application in October – initial discussions have begun. We realise that even success in the next SFF round means the 2013-14 season may be missed. AgResearch and the Ag. Board are likely to agree to some inspections and continuation of the science behind the work in this season so that we can broaden the scope of the extension perhaps in the 2014-15 season. We would dearly like to continue the momentum that we have built up this season.

Malcolm Deverson
12 July 2013

p.s. A further application in this field was submitted by AgResearch with our support for the 2014 SFF round but was unsuccessful.