

## SLUGS AND THEIR CONTROL

### Introduction

Slugs and their control have proven to be of particular importance under reduced tillage regimes worldwide. LandWISE trials have, so far, found slugs to be a manageable problem where care is taken to control them.

The following is an overview of the current knowledge along with the experience that LandWISE has gained through its trial work. While there are no set programmes for slug control, key guidelines are emerging.

### Identification

A range of slug species are pests in New Zealand. The two main species that prove most economically damaging are:

1. Grey garden slug *Derocerus reticulatum* (fig 5)
2. Brown field slug *Derocerus panormitanum* (fig 2)

Two other species to watch out for are *Milax gagates* and *Arion spp.* Luckily all slug species respond to standard control measures.

The **eggs** (fig 1) are small 2-3 mm round opaque bodies usually laid in groups of 10-15.



*Fig 1 Cluster of slug eggs*

The juveniles are just miniature versions of the adults and emerge as such directly from the

eggs. The adults (figs 2 & 5) are approx 10-25mm long.



*Fig 2 Brown field slug*

### Where will I find slugs?

Due to the nocturnal nature of slugs, finding them during the day can prove difficult. However, slugs are not exclusively nocturnal and cool, damp and overcast conditions will encourage daylight surface foraging.

Slugs can be found in a variety of places:

- under broadleaf plants
- under sods of dirt
- under residue.

### Slug problem identification

The best way to avoid crop damage is to **MONITOR** on a regular basis. There are several methods for doing this.

**Important Note: for any of the following procedures be sure to look throughout the paddock. Unlike diseases, pests tend to occur in hotspots within a site.**

### Pre-plant monitoring procedure

#### Step 1: 10 Minute Visual Check

Walking the paddock for 10 minutes and checking in the obvious places for the presence of slugs or slug damage is a good start in the assessment of your risk.

If you find slugs or damage easily using this method it is usually an indication of a significant problem and treatment is necessary.

If you don't find slugs using this method it DOESN'T mean you don't have a problem and it is time to move to step two.



*Fig 3 Ideal slug habitat*

### **Step 2: Overnight Assessment**

In the afternoon, take several damp sacks (or boards or even half round posts) and lay them throughout the paddock.

Leave them in place for a night or longer if you wish. In the morning lift the objects and check for the presence of slugs.

**This method of assessment will give you an idea of the slug levels in that paddock, under those conditions, at that time.**

Unfortunately action thresholds have not been established to help with decisions on whether to take action. Changes in weather can affect 'monitorable' populations overnight. The decision to treat or not is a decision for the farmer based on:

- the number of slugs
- paddock history of slug damage
- crop type vs risk
- weather/climate predictions

### **Post-planting assessments**

It is important to regularly keep a careful eye on your crop, particularly through the first few weeks of growth. Repeating the 10 minute visual assessment will give you early warning of potential problems. Typical damage indicating

the presence of slugs is 'shredding' of the emerging leaves (fig. 4).



*Fig 4 Typical leaf shredding damage on corn*

More difficult to define as slug damage and less obvious, is when seed simply fails to emerge. Often other issues need to be eliminated as well.

If it is slug damage, it is most likely that the slugs are simply travelling along the seed furrows hollowing out the seeds and/or chewing out the growing tip from the seeds.

### **What do I do if I have a problem?**

#### **Chemical Control**

Slugs are classified as Molluscs and are not part of the insect family. As such, only Molluscicides will kill them and not insecticides. This means that insecticidal seed treatments will not kill slugs.

There are two types of chemistry available to aid in the control of slugs.

#### **1. Chemical Group – Carbamate**

Trade Names: Larbait®, Mesurool Slug and Snail Bait® and Dismissal®.

Mode of Action – Work as stomach poisons causing paralysis, loss of muscles tone and death.

#### **2. Chemical Group – Metaldehyde**

Trade Name: Slug Out® and Blitzem® pellets.

Mode of Action – Immobilises slugs, causing irreversible damage to mucous cells in the digestive tract and skin leading to death.

More information about application rates, withholding periods and toxicity can be found in the New Zealand Agrichemical Manual and the Novachem Manual.

## Application methods and timing

LandWISE has done no work in comparing the efficacy of the following application regimes. However, all are commonly used in agriculture.

*Pre-baiting:* Broadcast half the required rate up to one week prior to planting. Then apply the other half at planting or broadcast immediately post planting. The method is possibly advantageous in high populations due to the effect on the slug population before the seeds are in the ground.

*“Down the Spout”:* The application of bait during the planting process is a good option if the planter has the capability. It allows for one less pass across the paddock and places the bait directly in the area of the seed.

*Post-plant Broadcast:* The bait is broadcast immediately post-planting (ideally within 24 hours). LandWISE reduced tillage trials have used this method with apparent success in high-pressure paddocks.

LandWISE members did note that, for the bait brands they tried, even distribution was difficult to achieve when applying by broadcasting.

Due to the unpredictable nature of this pest and the influence of the weather on their presence, application of slug bait, as an insurance measure, is not discouraged under reduced tillage.

## Cultural Control Methods

### *Avoid slug highways*

Slugs cannot actively burrow but their flexible mucous covered bodies are suitable for squeezing between cracks in the soil or following well-defined seed furrows. This is especially pertinent when direct drilling heavier soil types, which will more easily form distinctive seed slots as opposed to lighter more friable soils.

### *Reduce protective cover*

Good weed control, especially broadleaf weeds, and an extended 4-6 week fallow period reduces the habitat suitable for slugs.

Other measures for reducing protective cover include:

- Keeping residue clear of seed strip
- Reducing clod production when planting

### *Mob stocking*

Putting stock in the paddock to trample slugs has proved effective for control in conventional situations. A negative consequence of this is increased topsoil compaction.

Surface compaction may mean that greater down force is needed for the reduced tillage planter to penetrate the soil to the required depth.

It is a good idea to check the planter’s capability to deal with compacted soil before a decision to use mob stocking as a control method.

## Life cycle of the grey garden slug

The rate at which slugs reproduce and grow is very much dependant on climate and temperature. Optimum temperature for all slug activities, including egg laying, is 10 deg C, though they are active from 0-26 degC.

Slugs are hermaphrodites changing from juvenile, to male, to female as they grow in size. There are two peak egg laying times throughout the year, one in autumn and one in spring/early summer. This is especially true for reduced tillages sites. If conditions are favourable they can keep laying continuously throughout their reproductive lifetime.

Each female can produce up to 300 eggs. Eggs take approximately 6 weeks to hatch; once again this is temperature dependant. The lifespan of a slug varies. Spring hatched slugs will generally last 4-5 months with autumn hatching living for up to 12 months.



*Fig 5 Grey garden slug*

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