

MOUSE CONTROL Q&A

Mouse Monitoring

- 1. Mice numbers are patchy. What is the best way to keep up to date on how mouse populations are changing, moving and adapting?**

Active monitoring through the use of chew cards and counting the number of burrows in a 100m x 1m transect is the best way to keep informed about mouse populations in your paddock.

On a broader scale, localised feedback on mouse populations is very valuable in keeping informed about how mouse populations are fluctuating and the best way to do so is for growers and agronomists to use **Mouse Alert**, a section of feralscan.com.au to report real-time information on local populations. This allows for others in the region to see mouse activity. It is really important and helpful for people to not only report on mouse numbers BUT ALSO to report where mice are not being found. This provides better information to help understand mouse populations and model likely impacts. The data in mouse alert is also used in mouse forecasting models.

- 2. If I want to know the risk of mouse control issues on my farm, is there a tool I can use to learn more about the mouse population and risk in the area my farm is located?**

You can find helpful information on mouse monitoring and populations on the GRDC's website or through feral scan where you can go to the section on mouse monitoring. Also look at the recently published GrowNotes Tips & Tactics on Better mouse management links to all of which can be found on www.grdc.com.au/mousecontrolwebinar

- 3. Because there are a lot of growers on Twitter, could this be used as an additional monitoring resource using the hashtag #mousealert?**

Yes. Steve Henry is always happy to monitor grower observations on twitter but once registered on the Mousealert App it is really quick to enter your observations and reduces double-handling of information.

- 4. What do we need to do to quickly count current infestations?**

Due to the rapid breeding cycle and the ability of mouse populations to explode, it is very important to undertake active monitoring of mice. Part of the GRDC's new investment is to look at improved monitoring and since the funding announcement the GRDC has been approached by a company using drones to identify mouse holes. However, there are currently a number of ways to make a rapid assessment of numbers.

Chew cards are a valuable tool to assess population density and as a faster measure it is quick and easy to count active burrows along 100m by 1m wide transects. This enables you to get an estimation of burrows per hectare.

- 5. Do you have an estimated dollar value cost of loss/damage caused by mice, to the grains industry each year?**

Mice have been calculated to cost the grains industry around \$20–40 million per year (Mutze 2014) based on a study conducted after the 1993 mouse plague which has been updated to reflect current economic value. However, new economic impact data needs to be collected to better understand the full impact of mice.

Farming Practice Control Measures

- 1. Plagues normally lead to a point of mouse over-population where mice begin to cannibalise each other, leading to a population collapse. Does a drastic reduction in mouse numbers through baiting break the normal mouse plague cycle?**

Collapses in populations occur through a combination of several factors including reduced food supply, increased predation, increased disease and changes in social structure. It is not known whether baiting practices or changes in farming systems have altered this “plague” dynamic. A range of factors around mouse population decline will be investigated through the GRDC’s new investment.

- 2. Feed load is lower in March 2018 than it was in March 2017, yet mouse numbers are higher. Why? Is it because of gradual mouse build up in 2017?**

Yes. A high survival rate of mice through the winter of 2017 meant that mice started breeding from a high population base in spring 2017. Weather and available feed over spring and summer of 2017-18 has been favourable for mouse numbers to build up. The grain losses (pinched, frosted) during the 2017 harvest has provided some of this food source.

Additionally, when we get figures of 20,000 brome grass seeds per square metre, significant numbers of ryegrass seeds per square metre and losses from the header, and the fact mice need only 3g of food per day to survive, it doesn’t take a heck of a lot of food in the system to sustain a reasonable population of mice.

- 3. Other than baiting or grazing paddocks, what can be done now to reduce mouse numbers?**

There are a number of strategies beyond baiting and grazing which can be implemented to reduce feed availability. These can include activities such as cultivation, burning and prickle-chaining. The use of prickle chains and cultivation to bury existing food sources will increase the efficacy of bait when applied, as bait distributed over the surface then becomes the most easily accessible and available food source for mice.

Burning can also destroy existing food supplies and cover for mice which also results in increased natural predation as the mice have nowhere to hide. Reducing feed availability can cause mice to migrate to where food is more readily available which can be a good time to target mice with bait. Implementing these tactics as part of your baiting strategy is important. The level of impact on mouse populations of different control measures in a multipronged strategy forms part of the body of work to be conducted under the GRDC’s new \$4.1m investment.

- 4. Re-infestation of crops through the fence from neighbouring pasture paddocks is a problem. What baiting strategies do you recommend to address this?**


Perimeter baiting is the best strategy in this circumstance. Baiting is most effective when you are able to work with neighbours to plan your baiting strategies and implement them at the same time. Additionally, it is important to follow label instructions whilst perimeter baiting as there are increased restrictions of use for perimeter areas such as buffer zones around trees and requirements for bait to be spread.

Restrictions on perimeter baiting using zinc phosphide include use within 50m of the crop include:

Restrictions:	<p>DO NOT apply bait to bare ground (including fallow where there is no vegetative cover). DO NOT apply bait in a trail. DO NOT apply bait if heavy rain is imminent. DO NOT apply to the outer 50 m of crop or within 50 m of native vegetation. A 50 m buffer zone in crops must be employed to reduce risk to birds and other non-target animals. DO NOT apply unless monitoring of mouse numbers indicates the potential for crop damage of economic significance.</p>
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An alternative control chemical CHOLECALCIFEROL can also be used in perimeter baiting with bait stations.

Statement of Claims:	<p>For the control of rats and mice along perimeter fence lines and in and around industrial, commercial, agricultural and domestic buildings.</p> <p>Controls rats and mice resistant to anticoagulants</p>
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Restraints: 	DO NOT exceed 3 m between bait stations for mice, or 9 m for rats on initial application. DO NOT place baits in the open – Baits must only be used within lockable tamper resistant bait stations. DO NOT use this product for the control of native rodents or other native animals.
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You can find additional information at:

<https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/pest-animals-in-nsw/mouse-and-mice-plagues/mouse-baiting-faqs>

5. Speed tilling with a disc prickle chain has led to wind erosion in the Donald area, Nth west Wimmera. Is this an issue you have come across before?

This is a really good point and we are only advocating this action if it is already part of your cropping system. Over the past 2 years the use speed tilling and disc chaining has increased and as such provides an opportunity to target mice through an application of bait once other residual food has been buried.

6. GRDC have factsheets/media releases on what we are talking about. Is there anything new please?

The GRDC's new investment is aimed at providing new information on mouse management under no-till systems. The work that is planned around food preference and bait substrates will provide critical information about bait applications in different crop types. This investment to better understand mice in no-till cropping systems will provide insights that lead to more strategic use of current control technologies.

Additionally, information on grower innovations on bait spreading behind air-seeders is new, some of which can be found in relation to Q6 of the Farming Practice Control Measures section (below). The GRDC is also holding a follow-up webinar on Best Practice Baiting in April which will cover some of this content. Please visit www.grdc.com.au/mousecontrolwebinar for further information.

7. Is there a good spreader for mounting on a seeder bin?

Yes there is a range of small 12-volt broadcast spreaders that will spread bait to around 24 metres and are relatively low-cost. Most of those get mounted to the seeder bar, if you've got a tow-between bin or a tow-behind air-cart, you can attach small 12-volt spreaders to that. Most have an electric shut off so you can control them from the cab or get them to turn on or off as the seeder kicks into gear.

Calibration and the equipment on the back of the seeder bar is critical, it can be difficult to reduce spinners down so that you're only covering 12 -18 metres at 10km/hou.r, Growers have made adaptations where they have put something inside the conventional belt spreader and metered from that to get around the problem. Additionally, issues associated with churning bait in spreaders and potentially sloughing Zinc Phosphide off the grain as it sits churning above the spinner, is an area that could potentially be solved quite quickly through measures like putting cameras in spreader bins and is potentially in the scope of the research to be undertaken in the short term

ADD in links from Ben White – see Maureen about GC article

GRDC is hosting follow up mouse webinar on practical application – Best Practice Baiting in April, where issues such as this will be discussed. Keep an eye on www.grdc.com.au/mousecontrolwebinar for further information.

Rodenticide / Bait / Chemical Control

1. Zinc Phosphide is the only chemical available for mouse control at present. How long before we can expect to see another broadacre rodenticide on the market?

New chemical discovery is a high-risk investment. Additionally, the regulatory approval process is a lengthy one. Despite this the GRDC has invested in research to find alternative actives. It is important it is to have diversity in control options. Whilst a large range of potential actives have been investigated as broadacre control options, all but one active have had to be abandoned.

Actives dropped from the search for additional control options were eliminated based on issues such as low efficacy, off-target damage such as secondary poisoning, high costs of manufacturing or inhumane mouse death.

The single remaining active in the research program is currently undergoing toxicology testing (human and environmental toxicology). This is a co-investment between the GRDC and the United States Department of Agriculture (USDA). Any work starting now is probably going to be at least 8, possibly 10- 12 years away before all the toxicology and environmental tests are complete. Unfortunately, there are no guarantees this investment will be successful in bringing an alternative rodenticide to market.

As with the discovery of other agricultural pesticides, finding new actives is very difficult. No new herbicide modes of action have been developed in almost three decades despite billions of dollars being spent by multinational corporations to find new actives. Whilst in this time new products have been released, they all utilize pre-existing modes of action.

2. Strychnine and 1080 have previously been cost- effective chemical control options. Is there any possibility we could get access to these chemicals for broad scale mouse control again?

Regulation of agricultural chemicals is the jurisdiction of the National Registration Scheme between the States and the Commonwealth under the AgVet chemical Act. The Australian Pesticides and Veterinarian Medicines Association (APVMA) must determine if a product can meet regulatory requirements including standards which mean a product must not cause harm to human health or the environment, must not affect trade through residues and is efficacious.

Unfortunately, strychnine and 1080 have been deemed to have high risk of leading to off-target secondary poisoning and as such are disallowed for use as bait. Additionally, strychnine has also been shown to be taken up by wheat plants in certain soil types. The methodology for use in the control of rabbits and wild dogs mitigates the risk of secondary poisonings which is why it can be allowed under this use whilst it is not appropriate for use on mouse bait.

3. Why was registration for grain-baited Bromadiolone as a perimeter bait removed?

Due to secondary poisoning.

4. Are you seeing any evidence of mice preferences for different ZnP baits?

Whilst there have been other reports of differential preference for one product over another, there has been no consistency in the preference. It is hoped that the upcoming bait substrate trials will provide some of the answers to issues around food or bait type preferences.

5. Is it ok to spread mouse bait and snail bait together pre-seeding?

No. If snail and mouse bait are spread together some mice by chance, will consume snail bait instead of mouse bait which will make the mouse sick but will not result in death. Those mice which have taken snail bait then tend to develop bait shyness. It is better to apply mouse bait first and follow up with snail bait a couple of weeks later.

6. Is it correct that 1 treated grain of wheat is enough to kill a mouse?

Yes. Each treated grain is a lethal dose. Spread at 1kg/ha baiting provides 20,000 lethal doses per ha. A mouse may consume more than one grain before it dies, but one grain is sufficient to kill it.

7. Can we get registration to use a higher rate of spreading?

1 kg/ha should be sufficient in all situations. 1 kg/ha provides 20,000 to 30,000 lethal doses per hectare. Even if you have a heavy infestation of mice (say 1000/ha), there should be 20-30 lethal doses per mouse.

1. Why are there no accredited bait mixing stations in Victoria?

Establishing an accredited bait mixing station or formulation site relies on finding a willing registrant. The registrant or chemical supplier must weigh up the business case for establishing the site taking regulatory requirements and cost-benefit analysis into account. To date no registrants have established a formulation site in Victoria. In South Australia the establishment of formulation sites was supported by Grain Producers South Australia (GPSA).