



## SOUTHERN REGION

# LESSONS FROM THE YORKE PENINSULA TO IMPROVE SNAIL BAITING EFFECTIVENESS

Applying snail bait with a spreader after seeding is a common control method on Yorke Peninsula but recent research has shown growers need to adjust their spreader settings for more effective coverage.



PHOTOS: DEANNA LUSH

A snail bait distribution trial on Yorke Peninsula in 2013 tested the coverage of Amazone, Bogballe, Kuhn and Vicon urea spreaders with Meta, Metarex, Slugger and Slugout snail baits.

## KEY POINTS

- The size and density of a bait pellet determines the distance it is spread.
- Spreaders are designed for use with fertiliser so snail and slug bait is not spread as widely as farmers may expect. This effect was demonstrated in a recent trial on Yorke Peninsula.
- Fragmentation of baits can occur, reducing the number of effective baits.
- Growers must calibrate their spreaders especially for snail bait to achieve optimal bait coverage.
- Ute spreaders provide an uneven distribution of snail and slug bait.

Snails cause significant problems in South Australia by damaging young and emerging crops and contaminating grain at harvest. Snail baiting by spreading molluscicides over the planted area is one of the common ways snails are controlled, along with cultural methods such as cabling, rolling or burning.

In recent years, snail numbers on the Yorke Peninsula have been measured as high as 2500 snails per square metre, with ideal seasonal conditions for snails meaning that cultural control alone has not been effective. In a 2013 survey of growers in the mid and lower Yorke Peninsula by the Yorke Peninsula Alkaline Soils Group (YPASG), 100 percent of respondents reported snail activity on their property, and the majority made machinery modifications or used snail cleaning equipment on grain.

While general snail control information can be found in the GRDC's Snail Management

Fact Sheet (see Useful Resources), a recent trial on the Yorke Peninsula demonstrated that commonly used equipment for applying snail bait does not provide the bait coverage that growers expect, and spreader settings must be adjusted for effective control.

The most common method by which snail baits are spread on the Yorke Peninsula is using a urea spreader. Ute spreaders are also used, particularly along fencelines, but are not as effective.

## Fast Track Project

Trials were performed by YPASG and the South Australian Research and Development Institute in 2013 through a GRDC Medium Rainfall Zone Regional Cropping Solutions Network 'Fast Track' project to investigate the effectiveness of urea and ute spreaders in distributing snail bait.

The trials were conducted in August 2013 at Urania. Four urea spreaders were tested with four different brands of snail bait: Amazone, Bogballe, Kuhn and Vicon spreaders, with Meta, Metarex, Slugger and Slugout.

The trial involved running each spreader-bait combination three times perpendicular to a row of 50 trays placed at one metre intervals across the potential width of the spread (see photo). The number and mass of baits per tray were then recorded and analysed. Each combination was tested with a number of different spreader settings, with the best settings then used for comparison with other combinations.

The aim of the trial was to find the best settings for each spreader, not to find a best spreader-bait combination. Each spreader is capable of distributing bait in a way that snails can receive a lethal dose but growers must use the correct settings.

## Results

### Spread width

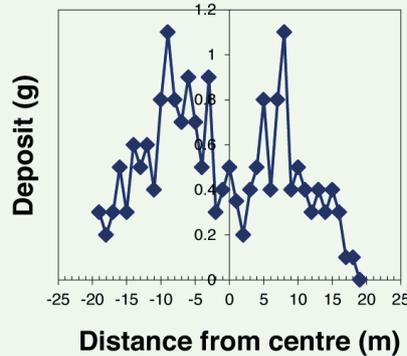
The spread-width was measured based on a 20 percent coefficient of variance, which refers to the width being tested. The bait dose had to be within 20 percent – either above or below – the target rate. The industry standard is tighter at 15 percent, but the specification was relaxed in this trial because of the variable results from each spreader-bait combination.



A series of black trays were set up to catch the snail bait as it was distributed by each spreader. The baits captured in each tray were collected and the weight measured and recorded to compare efficiency.

PHOTOS: DEANNA LUSH

### Distribution



### Distribution

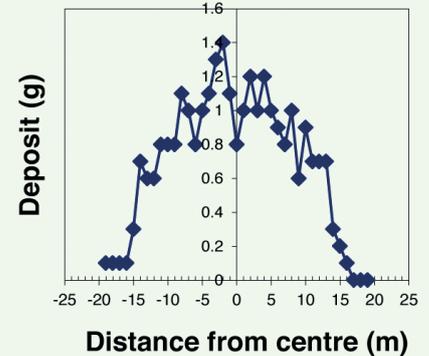


Figure 1: The distribution map for a poor spread (Slugger-Bogballe combination) on the left shows highly variable bait deposit across the width compared to a good spread (Meta-Bogballe combination) on the right, with far lower variation.

SOURCE: HELEN DEGRAAF & GREG BAKER

## Rules of thumb

When setting up a spreader to distribute snail bait, growers must:

- Check the settings:** Optimal settings for spreading snail bait are not the same as for spreading urea.
- Calibrate the spread:** Snail bait spread will not be as wide as when spreading urea. Calibrate your machine and bait combination to get the right application rate.
- Minimise ute spreader use:** Ute spreaders provide poor coverage of snail baits and should only be used in areas where larger spreaders cannot reach.

While the optimal settings for spreading snail bait will be different for every application, Table 1 (page 4) provides a suggested starting point, based on the YPASG trial results.

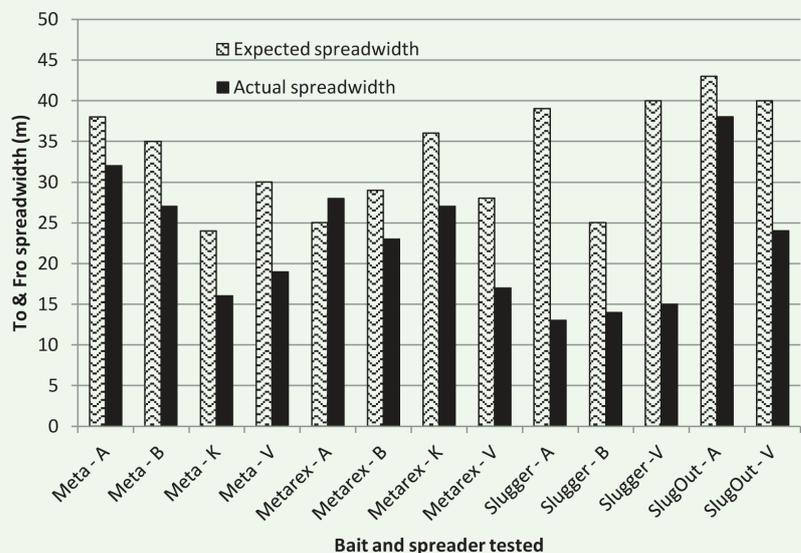


Figure 2: Expected spread width (m) and the actual spread for spreader-bait combinations (spreaders A= Amazone; B= Bogballe; K= Kuhn; V= Vicon). Set rates for products were: Meta 10kg/ha (Meta-K 5kg/ha), Metarex 5kg/ha, Slugger 10kg/ha, SlugOut 5kg/ha.

SOURCE: HELEN DEGRAAF & GREG BAKER

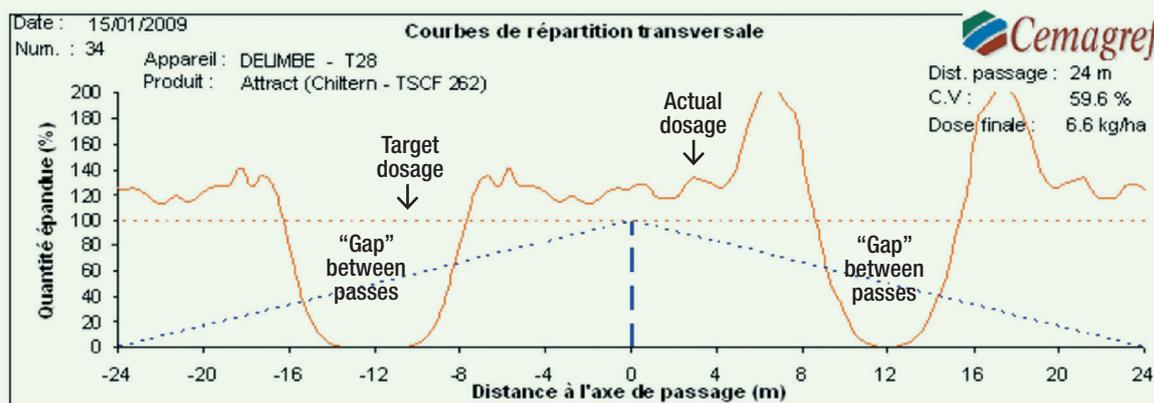


FIGURE 3: French trials have also concluded that calibration of spreader machines is critical to producing an even distribution. This graph shows low dosage rates between passes where calibration was not performed.

Figure 1 shows the actual spread width was generally narrower than expected. On average the width that baits were actually spread was only two-thirds of the width which growers thought they were spreading. The size of the bait affected the spread, with the larger bait size of Slugger resulting in a narrower spread compared to the smaller bait sizes.

The implication is that only two-thirds of the area will be covered by bait, and one-third of each pass will have low or no bait dosage.

Growers need to calibrate their spreader with the intended bait product by spreading a pass and either measuring or visually assessing the width that baits are distributed, or by engaging a professional calibration service, such as through the Australian Fertiliser Services Association. This calibration will allow for accurate application and the correct dose to the entire area.

Some growers have experienced differences in bait distribution from different batches of snail bait. It is recommended that in subsequent applications of snail bait that growers perform an assessment to ensure the calibration is still correct.

### Fragmentation

Using fertiliser spreaders calibrated for urea can result in bait fragmentation.

Trial results showed higher numbers of baits in the middle of the spread width than was expected for the Meta baits. This was thought to be due to baits fragmenting, or breaking up into smaller bits, and creating multiple bait 'points'.

While the extent of fragmentation was not directly measured, the number of baits in the middle of the spread width was 7-19 percent higher than was predicted for Meta baits, meaning that, in some cases, a significant proportion of the baits had fragmented.

### Snail management

Snail baiting is one component of an overall snail management strategy. The GRDC has previously published a fact sheet providing guidelines for managing snails. The key points of the fact sheet are:

- Snail numbers can explode in seasons with wet springs, summers and autumns.
- There are currently no means to control juvenile snails (less than seven millimetres) after sowing as they are unlikely to find baits.
- A rule of thumb is if snail numbers are above 20 per square metre in cereals and 5/m<sup>2</sup> in pulses and oilseeds, be prepared to deal with grain contamination at harvest.
- Use header modifications and grain cleaning to eliminate snail contamination of grain.

- Snails appear to build up most rapidly in canola, field peas and beans. However, they can feed and multiply in all crops and pastures.
- Baiting before egg laying is vital. Timing and choice of controls will depend on the season. Understand the factors that determine control effectiveness.
- Stop baiting eight weeks before harvest to avoid bait contamination in grain.
- Monitor snails regularly to establish numbers, types, activity and success of controls.
- To control snails, you will need to apply a combination of treatments throughout the year.

The full fact sheet is available on the GRDC website (see Useful Resources).

Research is continuing into the effect of fragmentation. While it results in an increased number of bait points, it is unlikely that each of these smaller points can provide enough bait for a lethal dose. This means the fragmented bait is not likely to be effective.

For best distribution, growers who are using small baits should inspect their baited paddocks to look for any significant fragmentation. If baits are significantly fragmented (i.e. shattered into crumbs), growers should estimate the proportion and increase the dose. This is because the fragmented proportion of baits may be ineffective (e.g. if one quarter of baits are fragmented, increase the dose by 25 percent). However, growers must adhere to label recommendations.

### Ute spreaders

Two types of ute spreader were tested – C-Dax and Lehner. Neither spreader was

able to achieve a spread width of greater than eight metres and gave a lop-sided distribution, applying more bait to one side than the other. The trial concluded that it was not possible to achieve a stable and known bait dose with ute spreaders and they were best suited for control of snails along fencelines, where larger spreaders cannot reach.

### French trials

The recent YPASG trials are not alone in the findings relating to bait spread. Trials by French Institute Cemagref for DeSangosse (manufacturer of Metarex baits) demonstrated narrow spread width and some bait breakage with some bait types. A conclusion from these trials was the importance in calibration of spreaders to achieve a consistent dosage rate.

**Table 1. Suggested 'starting points' for settings when calibrating spreaders**

Growers are advised to calibrate their machine to optimise bait distribution. While the final settings will depend on individual circumstances, these settings are suggested as a starting point.

SOURCE: RUSSELL NICHOL

Spreader	Snail bait	Settings	Spread width (metres)
Amazone	Meta	OM24-48 16-50	32
	Slugger	OM24-48 16-44	23
	Metarex	OM24-48 16-50	28
	SlugOut	OM24-48 16-50	39
Bogballe	Meta	E8 Vanes 0 degrees tilt	27
	Slugger	E8 Vanes 0 degrees tilt	14
	Metarex	E8 Vanes +6 degrees tilt	23
	SlugOut	E8 Vanes +6 degrees tilt	25
Kuhn	Meta	S12 DP4	27
	Slugger	S8 DP8	7
	Metarex	S8 DP8	27
	Metarex	S12 DP4	27
	SlugOut	S8 DP8	37
	SlugOut	S12 DP4	40
Vicon	Meta	M18 Tilt +8 degrees	21
	Slugger	M27	15
	Metarex	M10 Tilt +8 degrees	18
Lehner	Metarex	Vane 2	8
	Slugout	Vane 2	8
C-Dax	Metarex	fixed	8

## FREQUENTLY ASKED QUESTIONS

### Do snails seek out baits?

There is currently no evidence that snails are attracted to baits – it is more likely that they just happen upon the baits in their normal movements. This means it is critical to get good coverage to ensure that the snails contact the baits.

### What is the best spreader-bait combination?

The trial did not intend to find a 'best' combination. Rather, any combination can be effective if the right settings are used and the spread-width is known. The choice of spreader and bait will take into account many factors, including cost, local experience and grower preference.

## USEFUL RESOURCES

### Snail Management

GRDC Fact Sheet  
[www.grdc.com.au/GRDC-FS-SnailManagement](http://www.grdc.com.au/GRDC-FS-SnailManagement)

### Bash 'em, Burn 'em, Bait 'em

Integrated snail management in crops and pastures  
[www.grdc.com.au/GRDC-Snails-BashBurnBait](http://www.grdc.com.au/GRDC-Snails-BashBurnBait)

### Snail bait distribution trial

GRDC YouTube Video Clip  
<https://www.youtube.com/watch?v=UWeoUUnzc2Q>

## MORE INFORMATION

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## GRDC PROJECT CODE

YPA00002

**Acknowledgements:** Greg Baker, Kristin McEvoy, Helen DeGraaf, Don Nicoll, Russell Nichol, Ashley Wakefield.

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