Snail control by flying baits, one story of aerial baiting

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Key messages

Previous research has shown good snail control comes from snails being able to come across baits and feed on them. The more even the bait distribution, the more likely the snails will come across a bait, feed on it and die.

It is becoming more common to apply baits aerially, but there have been no previous studies on the distribution of baits applied from aircraft.

In this study, we found the distribution of baits varied depending on the distance from the flight path of the plane and that bait application swath widths of the plane needed to be 15 metres rather than 30 metres. This trial highlighted that better calibration techniques are needed for aerially applied bait applications.

Background

The timing of baits for the control of snails needs to occur when snails are actively moving and feeding but before egg lay commences. This usually occurs after rains in autumn. Farmers have found that the time it takes to apply baits using a ground rig can be halved by using aircraft to apply baits over a larger area (pers. comm from grower employing plane).

Previous research has shown good snail control needs even bait coverage (Baker *et al.* 2015) however, we could not find any information about bait coverage when applied aerially. This trial focusses on what the spread pattern was on a single paddock at one time.

Aims

To determine the spread pattern from aerially applied baits.

Method

Trays of 0.19 square metre were placed at 1 metre intervals for 100 metres. Trays were placed perpendicular to the flight path of the plane. The weight and number of baits in each tray was counted after a single pass of the plane. The plane applied 4 kg/ha of a metaldehyde bait at 30 metre swath widths. Each bait had an average weight of 0.035 grams (based on an average of 100 bait weight) and was about 5 millimetres long.

Results

The bait density varied with the distance from the flight path. Between flight paths bait density dropped to less than 10% compared to on the flight path (Figure 1, between 2 and 32 m versus 10 to 25 m). Wind also m ay have been a factor in displacing bait distribution (Figure 1, bait distribution between 65 to 92 m). The spread pattern suggests that a swath width of 15 metres rather than 30 metres would have been more appropriate for this site on the day.

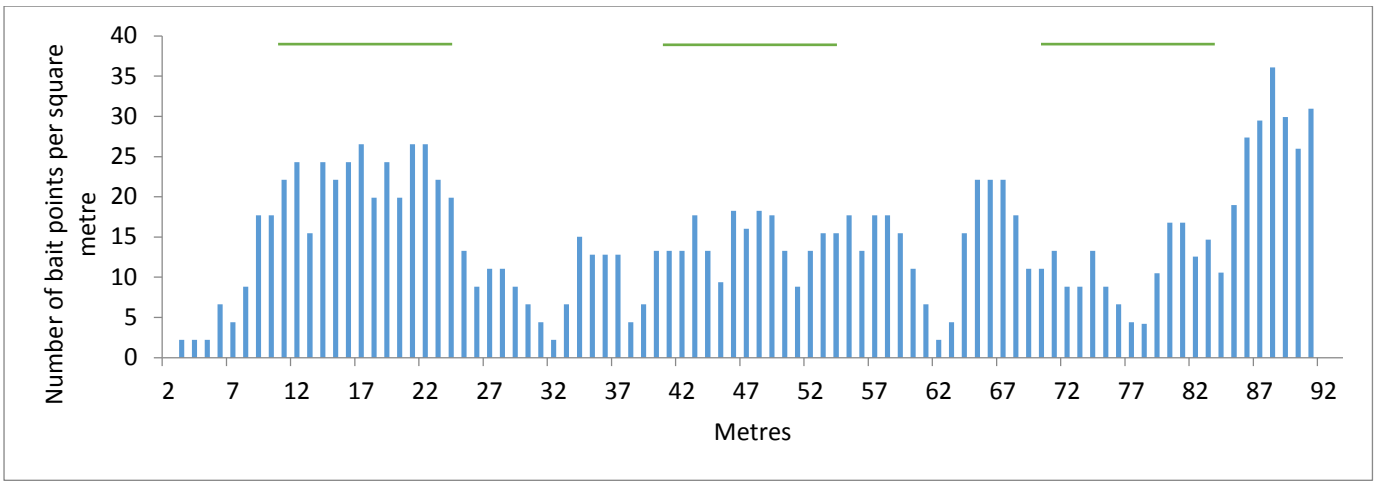

Figure 1: Number of baits per square metre across three flight paths. Lines indicate approximate width of each flight path.

If baits are significantly fragmented ie shattered into crumbs, then snails may only be feeding on a sub-lethal bait

dose. In this trial the extent of fragmentation was not directly measured. However, the average weight of a bait post aerial application was 0.044 grams which was similar to the weight of the baits prior to being spread (0.035 grams). This suggests that there was little fragmentation of the baits post aerial spreading.

Previous research (see Baker *et al.* 2015) has shown different baits have different spread patterns and differing levels of fragmentation. This was not a part of this trial. If aerial bait applications are going to be widely employed then plane swath widths for different bait sizes and shapes should be considered.

Costs and more costs?

The cost of aerially baiting at 30 metre swath widths was estimated at $8 per hectare (provided by grower employing plane). By following a flight path of 15 m swath widths, the cost of aerially baiting is estimated to increase by 50%.

Calibration guidelines?

During the course of this trial it was found that there were calibration guidelines for ground rig applications but these were not adequate for aerial applications of baits. There were no available guidelines for calibrating bait from aerial applications and there was no quick method to determine the bait spread patterns for aerially applied baits.

Conclusion

Plane swath widths of 15 metres would have led to an even bait distribution. The bait weights did not differ pre and post spreading suggesting that baits did not fragment and if fed on by snails would lead to a lethal bait dose

Easier methods for the calibration and some guidelines for aerially applied baits are needed to ensure adequate baits coverage is achieved.

It needs to be noted that different baits will have different spread patterns and this also needs to be ascertained.

Key words

Aeroplane, bait, application

References

Baker G, McEvoy K, DeGraff H, Nicoll D, Nichol R, Wakefield A (2015) GRDC Fact Sheet: Lessons from the Yorke Peninsula to improve snail bait effectiveness. https://grdc.com.au/Resources/Factsheets/2015/01/Snail-Bait-Application

Acknowledgments

The research undertaken as part of this project is made possible by the significant contributions of growers through both trial cooperation and the support of the GRDC's Regional Cropping Solutions Network, as well as the farmer groups South East Premium Wheat Association and Stirling to Coast Farmers, the authors would like to thank them for their continued support.

GRDC Project Number: DAW00251

Paper reviewed by: John Moore