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Testing snail repellence options

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Key messages

- None of the products tested repelled snails from senesced barley plants in the laboratory experiment.
- No treatment caused significant mortality of conical snails when assessed after 21 days compared to a water treatment.
- The Esperance field trial demonstrated pyroligneous acid having no repellence effect on the snails.
- This reinforces that products should only be used at registered rates, times and methods of application in crops for which they are registered.

Aims

These trials tested the repellence of some products being promoted or anecdotally observed to repel snails in broad acre crops. These products have no supporting data nor are they registered for snail repellence in crops.

Introduction

The change in farming practice from tillage to minimum to no-till in combination with increased lime applications in the southern high rainfall agricultural zone has created favourable conditions allowing conical snail (*Prietrocella barbara*) populations to build-up (McDonald, 2018). Snails not only feed on germinated crops but contaminate harvested grain which may cause downgraded or even undeliverable loads (Smith, 2019). While there are a number of management options there is no silver bullet solution for controlling snails.

Laboratory trials

The treatments in these two trials were water (nil), pyroligneous acid, saponins, urea solution and carbendazim.

Repellence trial

The five treatments were sprayed onto standing senesced barley plants that were set in moist sand in pots using a ute boom to simulate field application. Photos were taken of the pots every 3 minutes to monitor the movement of snails over time which were edited into a movie and scored for snail activity. The maximum height of snails on stubble and the total number of snails on the stubble were measured twice a day for the first 3 days then at 15 and 21 days after application (DAA) (figure 1). A total of 25 snails were placed in each pot after spraying.

Snail mortality trial

Mortality from exposure to these 5 products was tested in a separate experiment. All snails were collected from each pot 20 days after initial application and placing them in the centre of moistened paper in a petri dish. Snails which moved from the centre were counted as alive and those that didn't were counted as dead.

Results and Discussion for Laboratory Trials

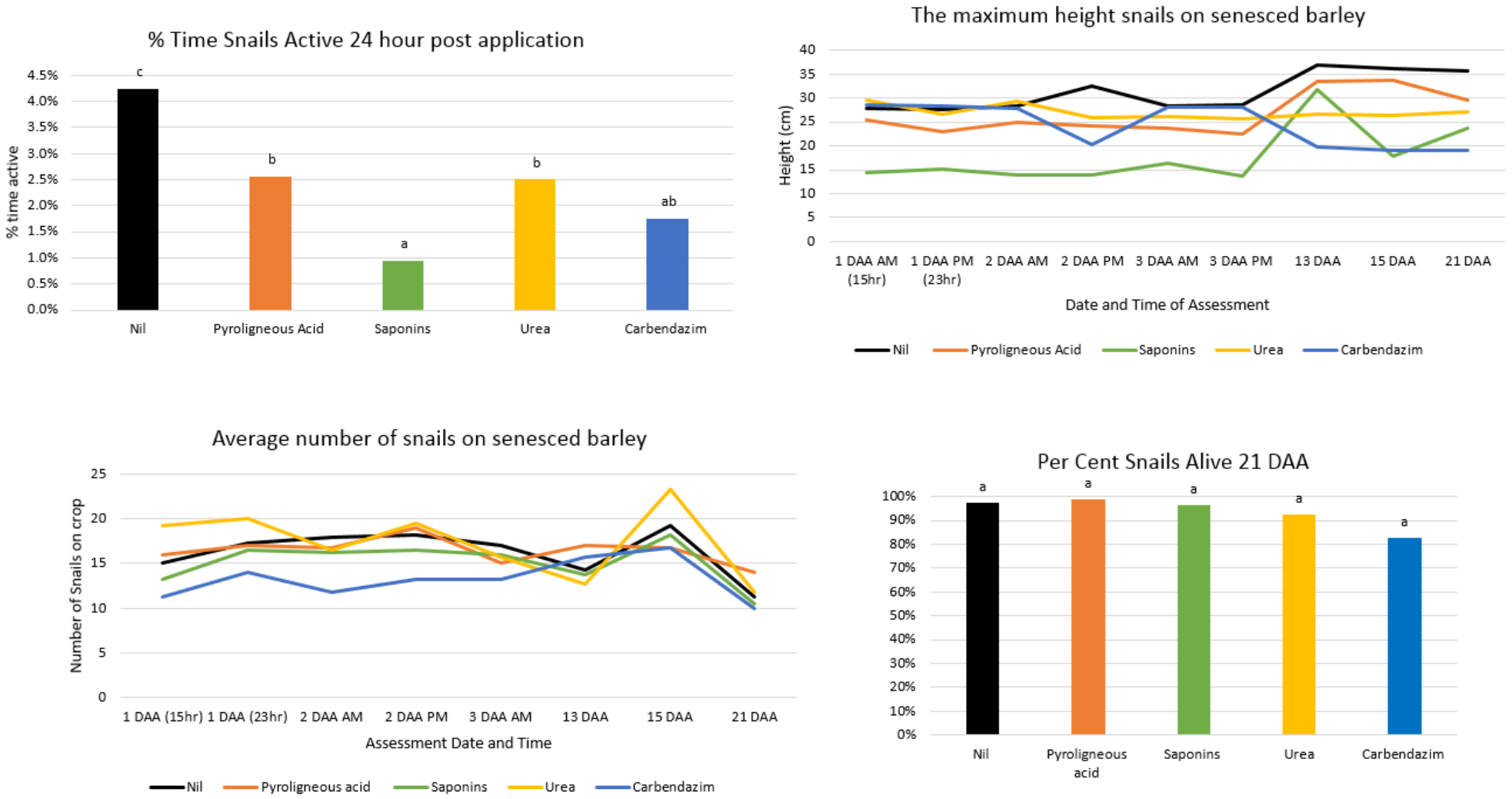

Figure 1. The per cent of time snails were active for in the 24 hour after application (top left). The maximum height of snails on senesced barley plants (top right). The average number of snails on senesced barley over 21 days (bottom left). The per cent of snails alive at 21 days after application (bottom right).

None of the products tested repelled snails from senesced barley plants. No treatment caused significant mortality of conical snails when assessed after 21 days compared to a water treatment. This reinforces that products should only be used at registered rates, times and methods of application in crops for which they are registered.

Esperance Field Trial

Two in-field experiments were conducted in the Esperance Port Zone (EPZ) to investigate the efficacy of a pyroligneous acid-based snail repellent product to repel or kill snails.

Site 1. 2019ES51 Effect on small conical snails in swathed canola in Myrup

The product was applied as a tank mix with glyphosate under a canola swath. Snail mortality was examined for two spray treatments (glyphosate only or glyphosate plus 500ml/ha repellent). Snails were collected from the trial site and placed into trays filled with soil collected from the site and placed under the canopy prior to swathing and exposed to treatments. Trays were then covered and kept under the swath or in a laboratory for 7 days before scoring snail mortality. Efficacy as a repellent was measured by counting snails 7 days' post-spray, on top and under the swath and in the inter-row at 10 points along each swath run.

Results show there was no difference in snail mortality in response spray treatments (table 1). The product did not repel snails from the canola swath; snail numbers did not differ between the treatments. The grower reported no decrease in snails in harvested grain samples after using the product.

Table 1. Mean mortality (%) of conical snails 7 days after exposure to two spray treatments.

	Spray treatment					
	Glyphosate only			Glyphosate + 500mL/ha repellent		
Location	Alive	Dead	Mortality	Alive	Dead	Mortality
Swath	27	3	11%	28	2	7%
Lab	28	2	7%	28	2	7%

Site 2. 2019ES52 Effect of snail repellent on white Italian snail on standing wheat crop

A grower in East Gibson with a high density of white Italian snails applied the snail repellent using a plane using a high (for aerial application) water rate (30L/ha) at 0.5L/ha and 1.0L/ha. Snails in the canopy within a 50 x 50cm quadrat were counted five times along each transect, with four transects per plane pass run. Snails were counted 7 days' pre-treatment and 2 and 8 days' post-treatment.

There was no treatment effect 2 days after treatment ($p = 0.224$) nor 8 days after treatment ($p = 0.385$). There was a difference between product rates in terms of change in snail numbers 2 days' post-treatment ($p = 0.038$); snail numbers increased under 1.0L/ha rate compared to nil and 0.5L/ha treatments. However, there was no change of snail numbers from before to 8 days after application for any treatment (Figure 2).

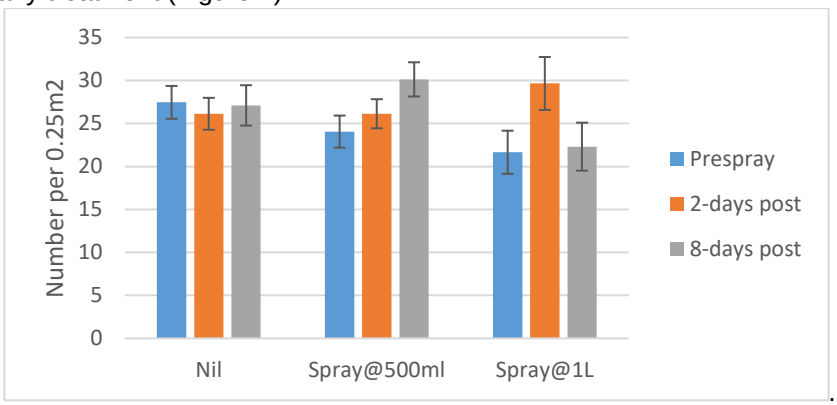

Figure 2. Effect of 'snail repellent' treatment rates on snails in crop canopy. Snail repellent treatment had no effect on Italian snail numbers in wheat 2 days and 8 days after application. Error bars are S.E.M.

Conclusion

No foliar spray treatments applied in this trial were found to repel snails from senesced barley plants at any time up to three weeks after application. The Esperance field trial showed the same lack of repellence. Products should only be used at registered rates, times and methods of application in crops for which they are registered.

References

McDonald, D. K. (2018). Snail Management Guide for WA Farmers. Stirlings to Coast Farmers supported by Council of Grain Grower Organisation Limited .

Smith, D. A. (2019). Mitigating Snails, Slugs and Slaters in Southern Western Australia. Grains Research and Development Corporation.

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