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Sharing Info

Baiting round snails prior to egg laying in accordance to environmental conditions on lower EP, 2017

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Location
Greenly - Dusty Parker
Rainfall (Wanilla)
Av. Annual: 523 mm
Av. GSR: 419 mm
2017 Total: 457 mm
2017 GSR: 298 mm
Paddock History
2016: Wheat
Soil Type
Red sand - grey calcareous sand
Yield Limiting Factors
Sub-soil constraints

Key messages

- **Baiting can be successful during warmer months if snails are active and feeding.**
- **Relative humidity >90% triggers snail activity.**
- **Periods of activity are not linked just to rainfall but also dew which can be forecast to some extent.**
- **Snail activity around rainfall events is dependent on significance of rainfall event as well as temperatures pre and post event.**
- **Do not cut bait rates as increase in bait number = increase in incidence.**
- **Decrease potential alternative food sources and refuge through summer weed management.**

Introduction

Previous SARDI work, including at Coulta (Gontar 2016), established critical points regarding the effective baiting of snails prior to egg laying. Firstly, if you plan on spreading bait at seeding, it is highly likely that egg laying has already taken place and snail issues will continue into the season. Figure 1 outlines this as the size of a snail's albumen gland reflects its level of preparedness leading up to egg laying (14 April). It is clear that control prior to egg laying is the most effective way of limiting population growth. It was also well established that cultural methods of control such as rolling were highly effective and not to be disregarded.

How was it done?

A Brinno TLC100 time lapse camera and HOBOware Pro data logger were assembled in the paddock alongside the trial site. Pestmaster bait (15 g/kg metaldehyde, 2.5 mm diameter) was placed under the camera every 7-10 days to enable the constant monitoring of feeding activity. Two baiting treatments at 7.5 kg/ha took place, one in February and one in March. Each treatment saw two 50 m strips baited, with 30 quadrat counts to assess the snail density in each strip. Counts were split into ten quadrat counts at each of the three marked positions. Pre-treatment counts took place 1-2 days prior to baiting followed by post-treatment seven days after bait application. Live samples were also taken in two paddocks, with gland dissections performed.

What happened?

Figures 2 and 3 demonstrate a steady increase in albumen gland size from early March. Such trends could be indicative of an increase in opportunistic feeding and hydration to allow gland size increase, however at this stage such conclusions are anecdotal.

Table 1 demonstrates the poor result produced by baiting over warmer months through a period that did not facilitate snail activity. During the week post baiting only two hours of significant snail movement were observed. Such a period is seen when conditions are dry, which is usually linked to hot, windy weather with a lack of rainfall. Baiting during such a period is ineffective. Table 2 shows greater bait efficacy (56%) as a result of 15 hours of significant activity during ideal conditions linked mainly to dew events (only two hours due to rainfall at the end of this period). This clearly shows baiting of snails as an effective means of snail control in early autumn.

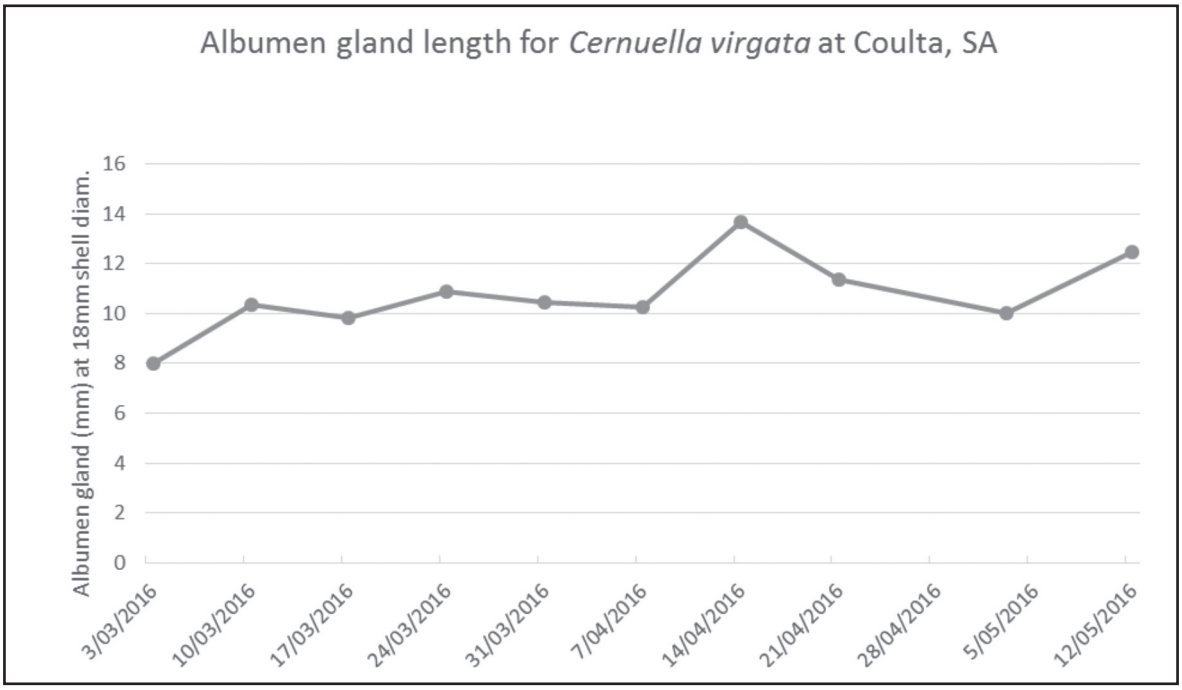

Figure 1. Albumen gland size variation over time at Coulta in 2016 (Gontar, Nash 2016).

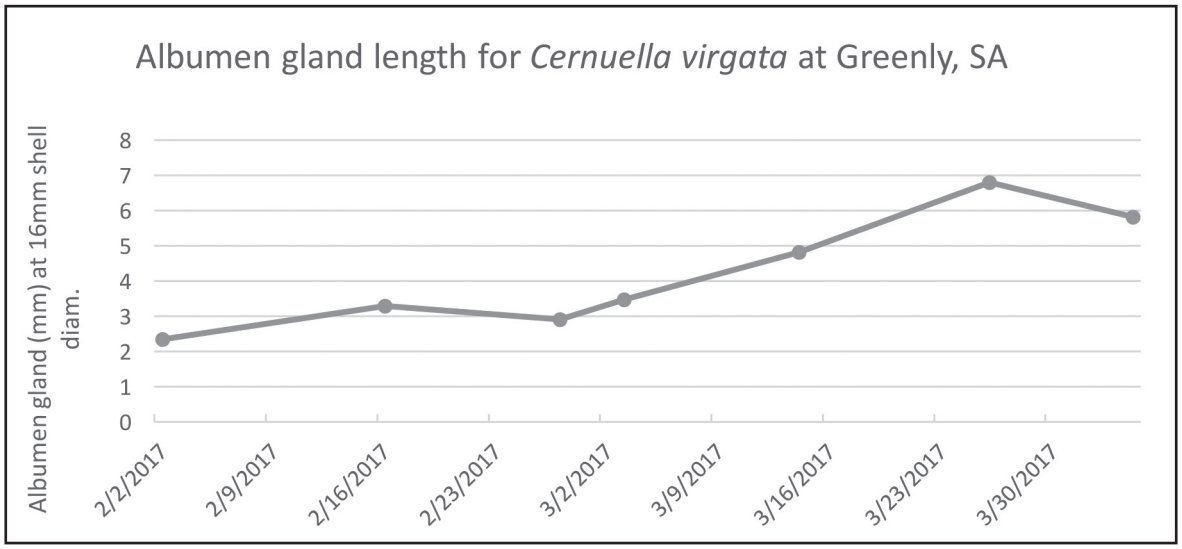

Figure 2. Albumen gland size variation over time in canola stubble at Greenly in 2017.

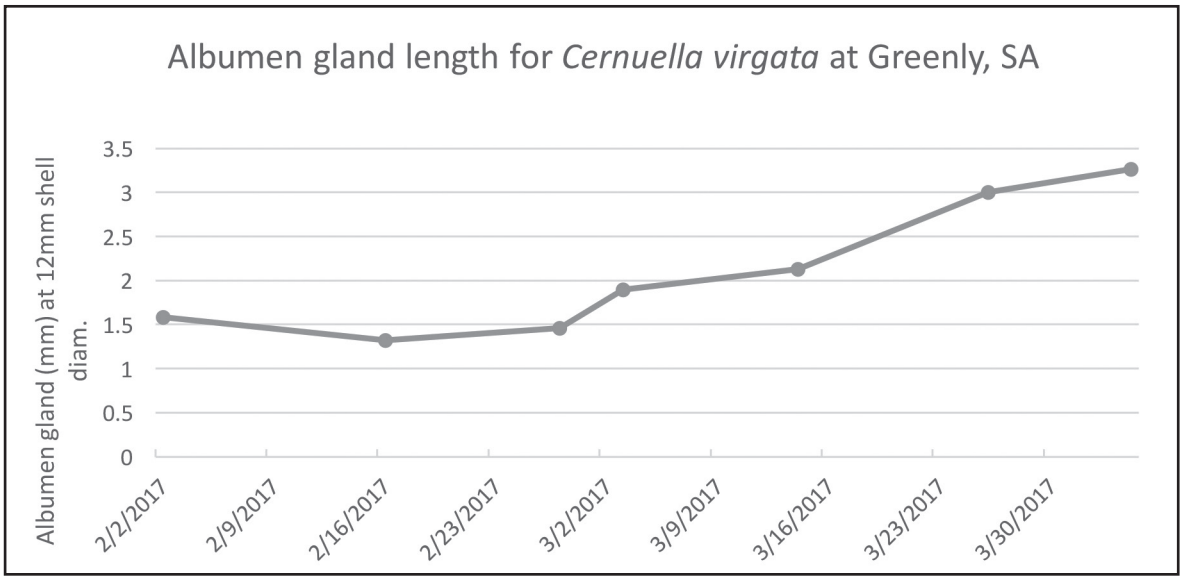

Figure 3. Albumen gland size variation over time in wheat stubble at Greenly in 2017.

Table 1. Snail population counts before and after bait treatment on 6 February 2017. Bait efficacy is the decrease in population accounted for by baiting.

Baiting treatment							Average
Monitoring point	1.1	1.2	1.3	2.1	2.2	2.3	
Snails/m² before	40	68	64	27	37	46	47
Snails/m² after	25	39	39	24	28	35	32
Popn change (%)	-38	-43	-39	-11	-24	-24	-30
Bait efficacy (%)	27	31	29	08	18	18	22

Table 2. Snail population counts before and after bait treatment on 6 March 2017. Bait efficacy is the decrease in population accounted for by baiting.

Baiting treatment							Average
Monitoring point	1.1	1.2	1.3	2.1	2.2	2.3	
Snails/m² before	25	37	33	29	22	27	29
Snails/m² after	3	12	10	5	7	1	6
Popn change (%)	-88	-68	-70	-83	-68	-96	-79
Bait efficacy (%)	62	48	49	59	48	68	56

Discussion

Cultural methods of snail control such as cabling and rolling can be a highly effective method of snail control (Gontar and Nash, 2016). Such methods are well known to provide the best control on hot days when the chances of desiccation of snails are greater.

Monitoring and research has now shown that snails respond to short-term weather change rather than calendar-based seasonal change. This provides growers with an opportunity to bait during periods of high activity prior to egg laying. High levels of activity are seen as a ground inversion (dew) or rainfall event results in >90% relative humidity (RH), and coincides with low daytime temperatures. Dew is driven by moisture near the soil surface from recent rainfall events, as well as ground inversion which is common on clear nights going into/during autumn. A combination of surface soil moisture, low wind speed and day time temperatures below 27–30 °C will greatly increase the chance of a ground inversion or dew. Daytime temperatures over 30°C will severely hamper snail activity. The more favourable conditions are, the greater the length of time snails will remain active each night. A heavy dew will facilitate around eight hours of activity in a night. BOM current weather observations, while not perfectly accurate, are a very good guide of periods when RH>90%.

Baiting efficacy is further increased if ground cover and alternative food availability is decreased (Baker, 2015). The autumn period also correlates with a greater snail mortality when baits are consumed, however there is still some un-accounted for variability (Brodie, 2017). Snails have been observed to move without feeding. This will clearly decrease baiting efficacy and must be taken into account.

What does this mean?

Cultural methods play an integral role in snail control over the summer months. With increasing knowledge and a level of predictability in the weather, baiting is another means by which snails can be effectively controlled prior to egg laying. However, if conditions do not facilitate snail activity and summer weeds are present baiting efficacy will be compromised.

Acknowledgements

This work was conducted on behalf of LEADA under the GRDC-funded Stubble Initiative (LEA00002). Thank you to the Parker family for providing a site for trial work, maintaining the site and baiting where required. Many thanks to Helen Brodie for her technical assistance and providing data.

References

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Baker, G. 2015, 'Stubble retention: A barrier to snail management'.

Brodie, H. 2017 'Integrated approach best for snail control', Nov-Dec 2017, GRDC Groundcover.

BOM Current weather observations: http://www.bom.gov.au/sa/observations/saall.shtml#WC