‘Be the snail’

Pathways to improved snail management

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PIRSA

PREMIUM FOOD AND WINE FROM OUR CLEAN ENVIRONMENT

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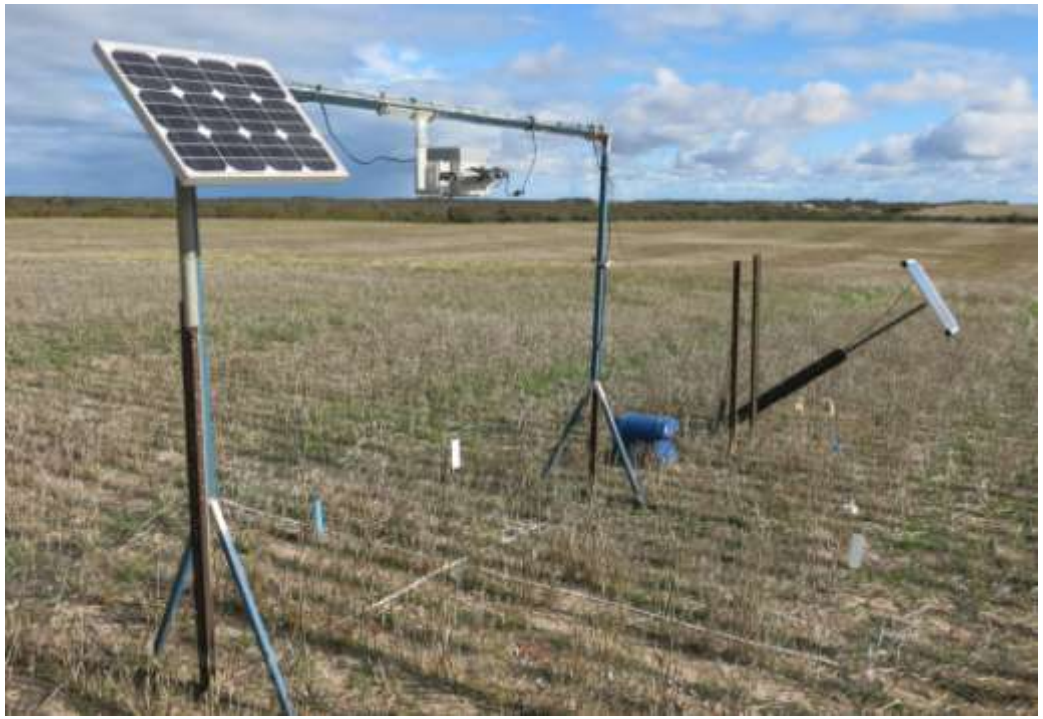
Summer Aestivation

- Activity triggers
  - Remote cameras in SA record snail activities
  - Also record temp/humid/soil moisture

Collaborators:
- NRM (M. Richards)

- Uni SA (S. Anderson, I. Lee, J. Cai)

- Growers (B. Cook, G. Hayes & others)



A simple life

1.

2.

3.

4.

Determinants of baiting effectiveness

1. Chance of Encounter

2. Ingestion of lethal dose

Juvenile Small pointed snails feeding on baits.

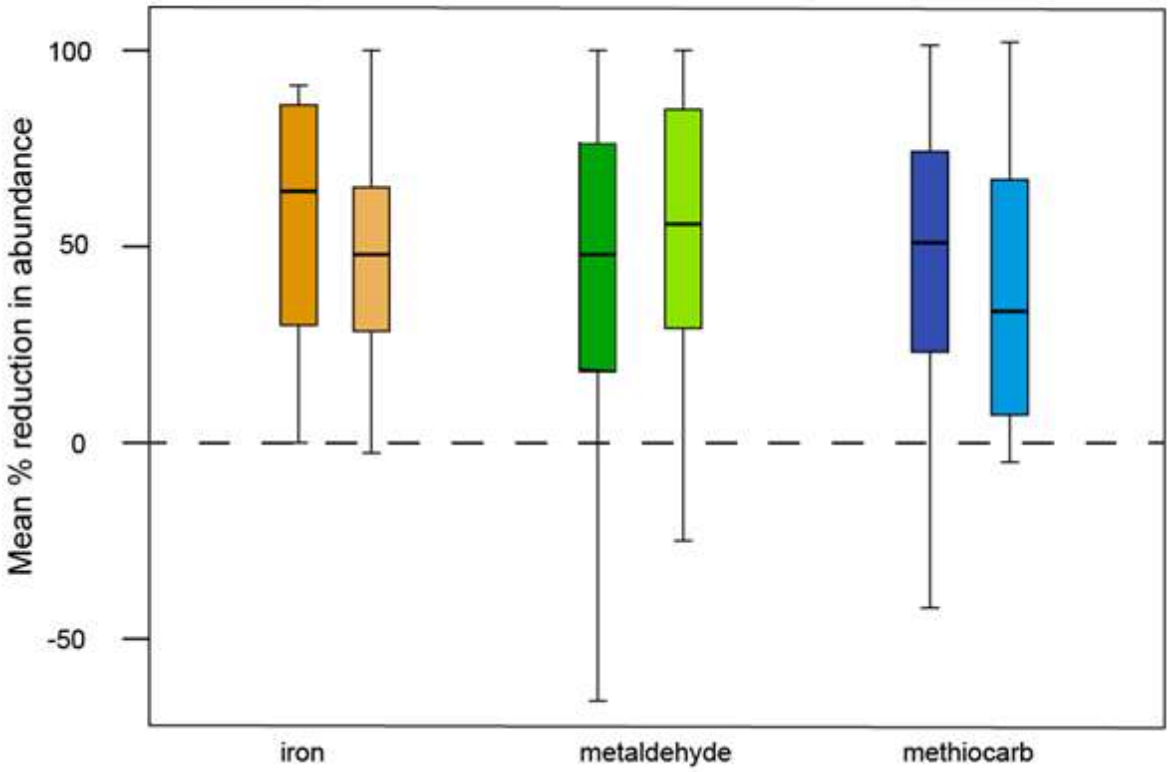
Chance of encounter

- Level of snail activity
  - Weather
  - Snail life-stage/physiological state
- Attractiveness of bait
  - Product formulation
  - Alternate food (green plant and stubble)
- Baits per unit area
  - Application rate relative to snail density
  - Uniformity of distribution (spreader performance/calibration for specific bait type)
- Level of ground obstruction (stubble, etc)

Ingestion of a lethal dose

- Palatability of bait
  - Product formulation
  - Field degradation (fungal anti-feedant effects, loss of physical integrity)
  - ‘Hardness’
- Quantity of bait
  - Bait size
- Adequate active ingredient
  - Formulation a.i. concentration
  - Field degradation (possible causal factors: temperature, UV, moisture, microbial)

The literature: FeEDTA and metaldehyde are 'best bets'

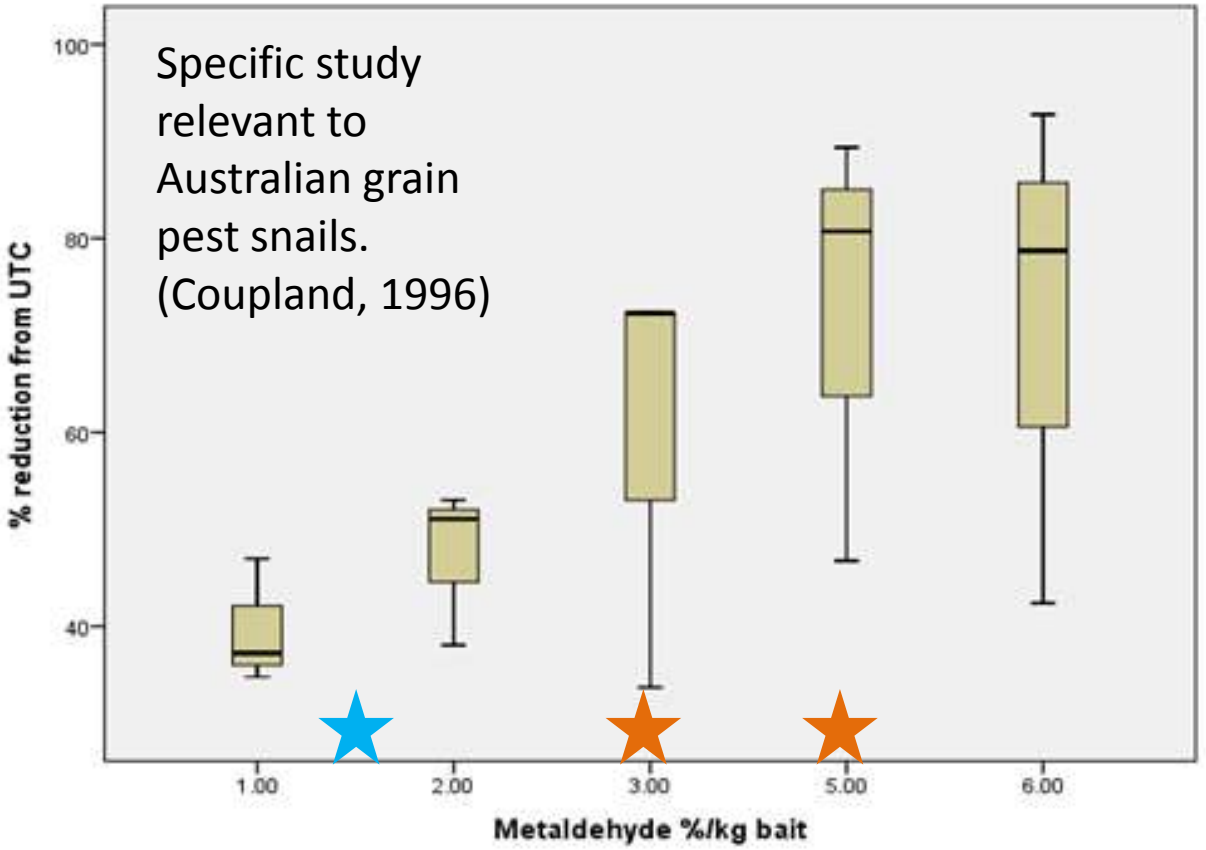


Slugs – left boxes

Snails – right boxes (lighter shaded)

- Limited number of active ingredients - similar efficacy
- Methiocarb has limited future (acutely toxic to vertebrates and many off-target invertebrates)
- We are focusing on Fe EDTA and metaldehyde bait products

The literature: Metaldehyde concentration is important



Australian baits:

★ - dry bran products

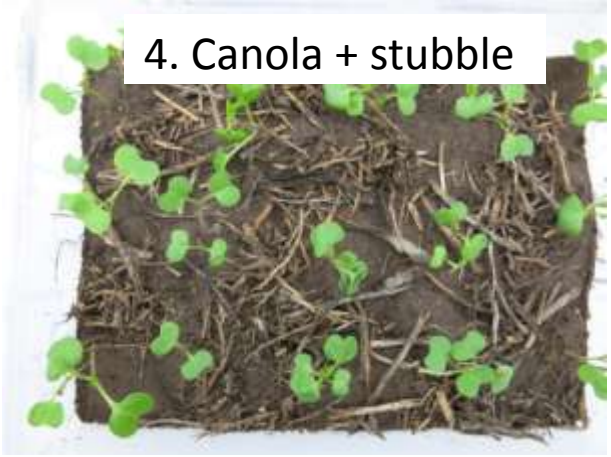
★ - 'wet' products

Need to increase the metaldehyde concentration in Australian dry-bran baits

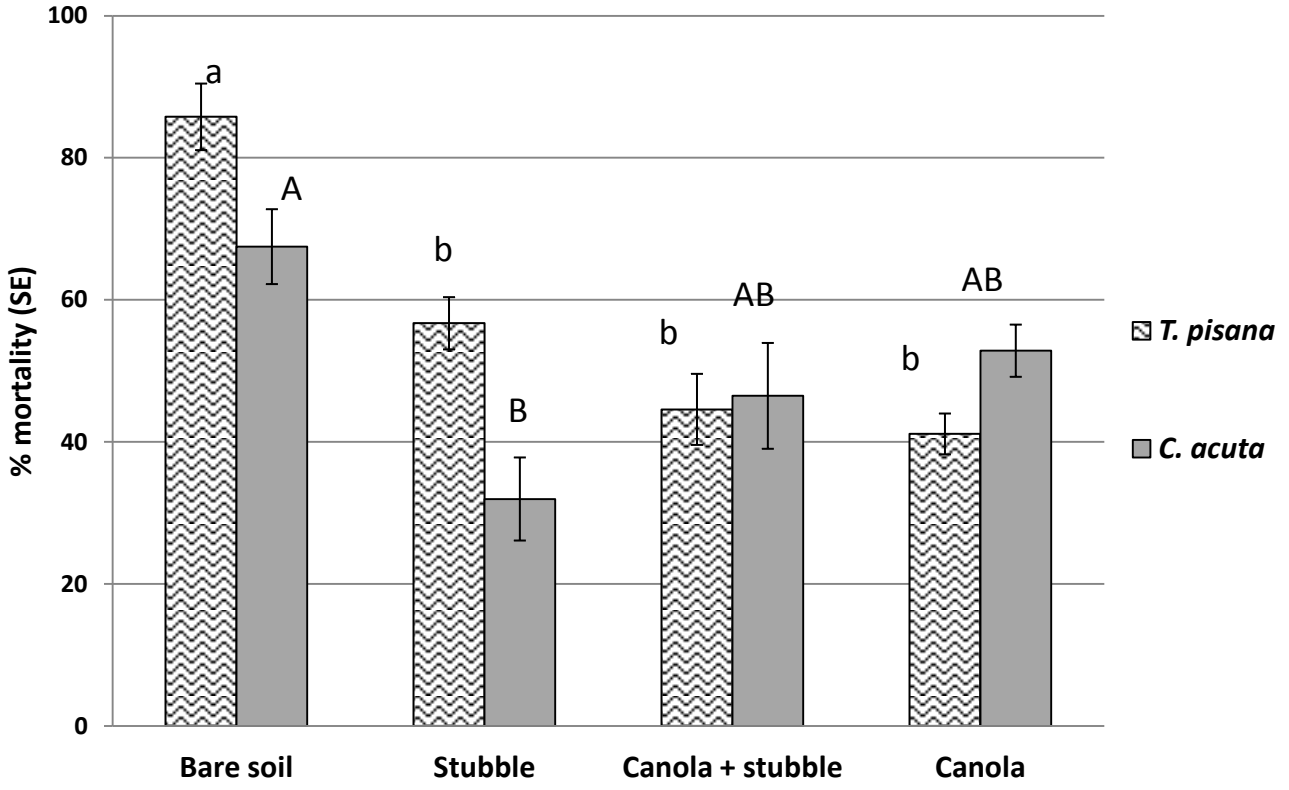
Does ground habitat / alternative food affect bait efficacy?

Tested hatchling *T. pisana* (white Italian) & *C. acuta* (pointed)

30 snails + 2 bait pellets per container



Does ground habitat / alternative food affect bait efficacy?



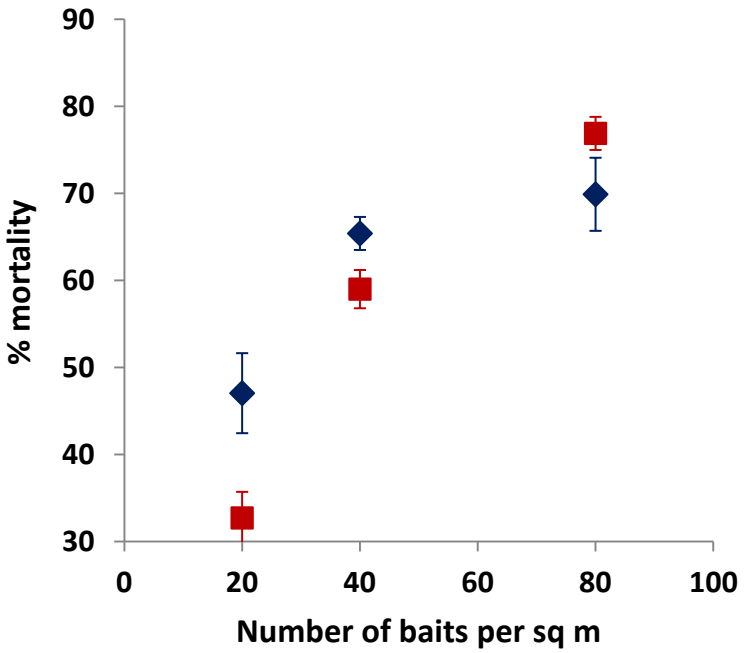
Baiting effectiveness is affected by ground cover and alternative food availability. → bait before crop is up

(Maybe burning or cultivation followed with 'targeted' baiting would provide synergistic benefits)

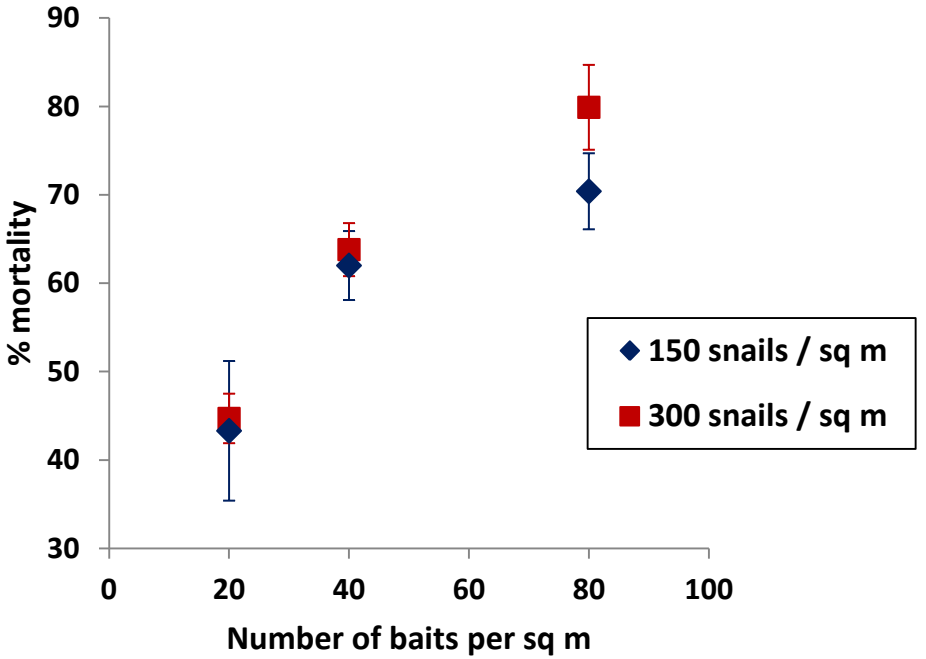
Effect of bait rate

Test Bait: Meta (0.2 m^2 field arenas) - Roseworthy, Sept. 2012

***Cochlicella acuta* (pointed) juveniles**



***Theba pisana* (White Italian) juveniles**

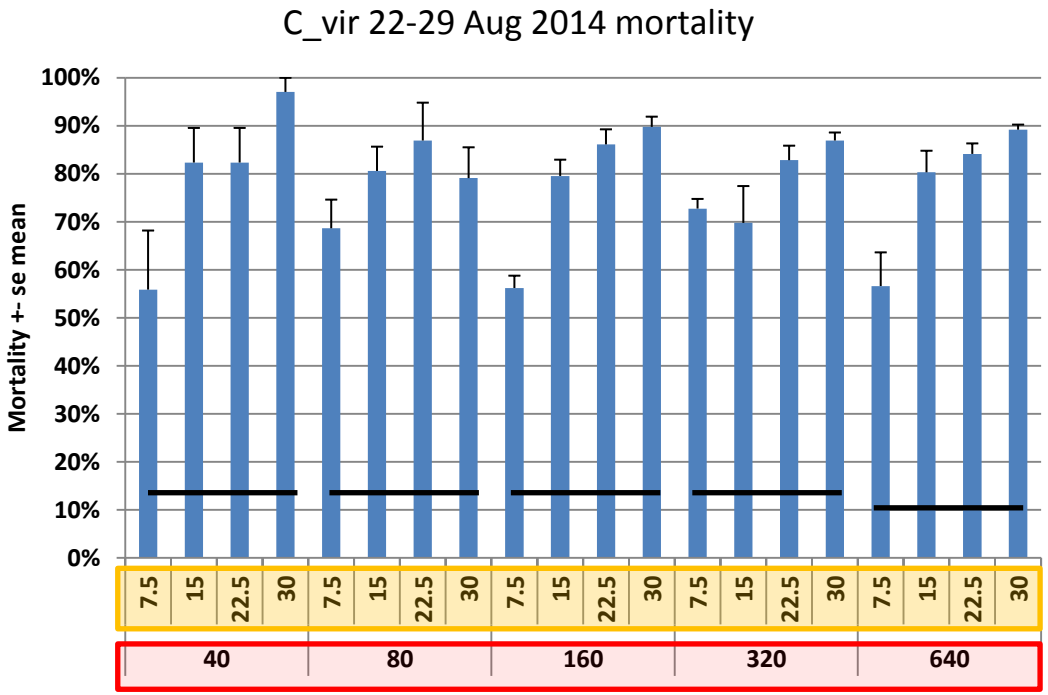


Note: Meta label rate =16-24 baits/m^2.

80 baits/m^2 = 375 g ai/ha (less ai than label rate of Metarex)

Baiting efficacy positively correlated with number of baits/m^2.
Ongoing studies with bait rate vs snail density.

Bait trials (product, rate, snail density & species)



Snail density (snails per m^2)

Bait rate (kg/ha)

GRDC Fast track: Bait spreading

- YPASG (Ashley Wakefield), AFSA (Russell Nichol) and SARDI Entomology
- 6 spreaders(4 3-point linkage, 2 ute-mounted), 4 bait products.
- ‘Effective’ spread width was 30% narrower than expected. Ute spreaders – limited applications.
- GRDC fact sheet out soon.

3-point linkage spreaders: Amazone, Kuhn, Vicon and Bogballe

HAVE YOUR SAY!!

Snails at Harvest: Grower experience and innovation

Please complete the online survey:
https://www.surveymonkey.com/s/sardisnailharvest

Let us know what parts of harvesting and post-harvest processes need improving to manage snails.

GRDC Grains Research & Development Corporation

SARDI South Australian Research and Development Institute

This is part of the GRDC funded project 'Improved management of snails and slugs' run by SARDI Entomology with assistance from Uni SA, SAGIT, YPASG, MacKillop FMG, Ag Excellence Alliance and other grower groups.