

# Stubble Retention: A Barrier to Snail Management?

SOUTH AUSTRALIAN RESEARCH & DEVELOPMENT INSTITUTE  
**PIRSA**

Greg Baker



# Identifying snail risk: Paddock

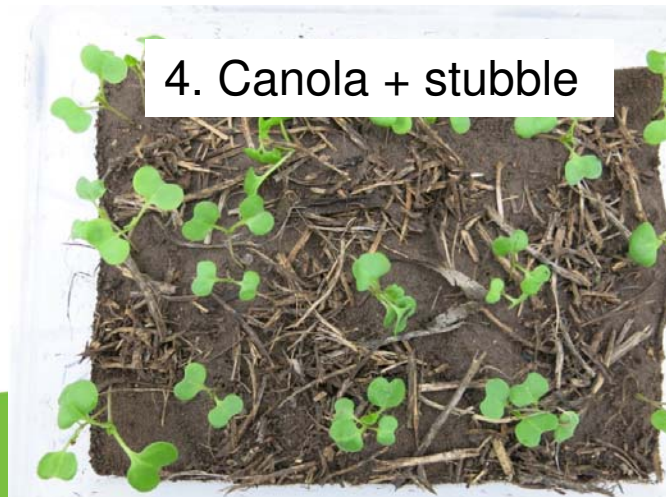
High risk	Reduced risk	Low risk
Alkaline calcareous soils		Acidic clay
Above avg. summer-autumn rainfall	Drought	
No till stubble retained	Burnt only	Tillage and Burnt stubbles
No sheep in enterprise	Sheep on stubbles	
Soil with improved moisture holding capacity i.e. increased clay content and organic matter		Sand no OM
Summer volunteers / Brassica weeds		No volunteers
Previous paddock history Snails Beans/ canola	Cereal crops	No snails Cereal crops

# Why Does Stubble Retention/ No Till Favour Snails?

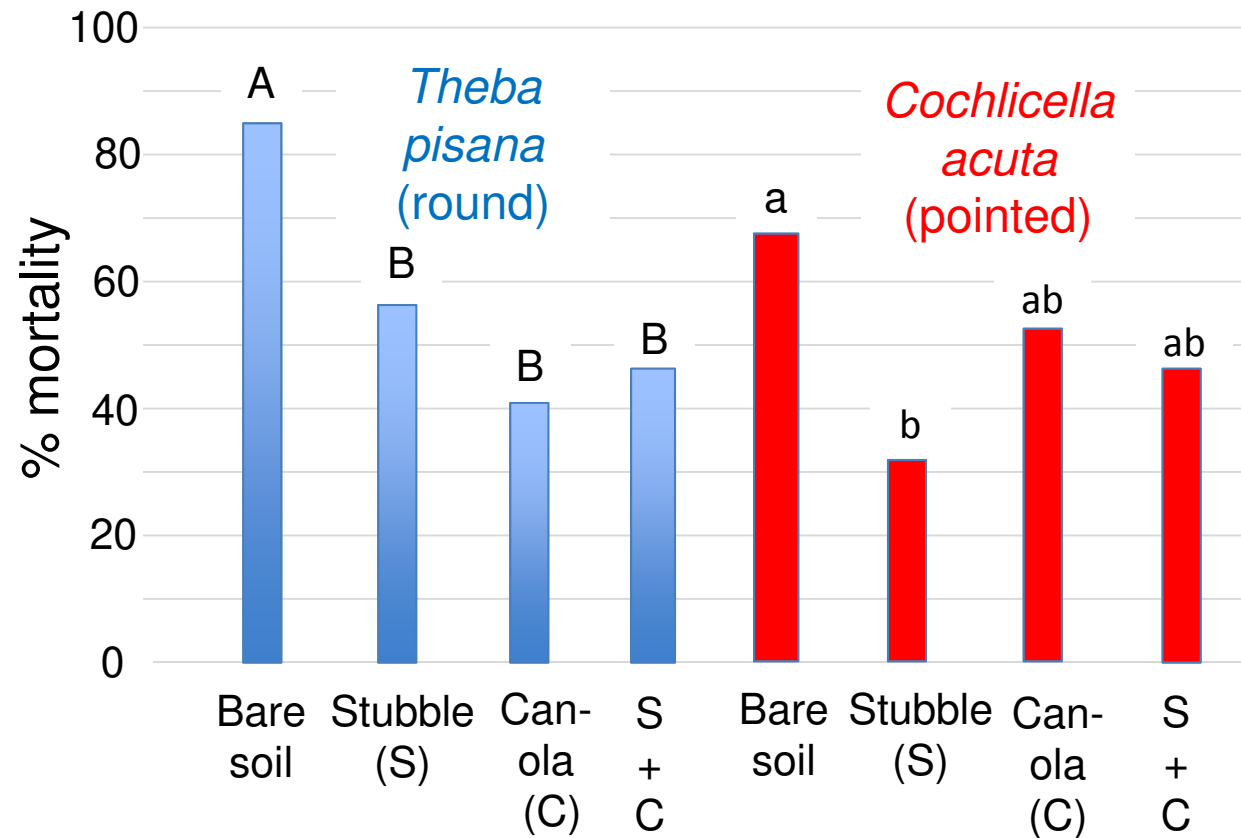
1. Lack of mechanical disturbance → increased survival.
2. Improved ground microhabitat (increased moisture & shelter) → increased reproduction and survival.
3. Increased off-ground summer refuge → increased survival of both round species and the large pointed snail.
4. Increased food supply → increased growth rate and reproduction of vineyard and large pointed snails.
5. Reduces chance of bait encounter.

# Effect of Ground Habitat/ Alternative Food on Bait Efficacy

Young (2-3 mm) Italian (*T. pisana*) & large pointed (*C. acuta*).  
Tested each species separately.  
30 snails + 2 baits per container.



# Effect of Ground Habitat/ Alternative Food on Bait Efficacy



**Conclusion:**  
Ground cover and alternative food availability effect bait efficacy.

# The Benefit of Summer Rolling/ Tillage.

Is there synergism benefit with baiting?

2016 LEADA Canola Stubble trial – B. Gontar and M. Nash

Treatments: 3 Stubble x 3 Bait

## A. Stubble treatments:

1. Untreated
2. Rolled (Ribbed roller towed at 12km/hr)
3. Tilled to ~5 cm depth with K-Line SpeedTiller (off-set disc & cage roller)



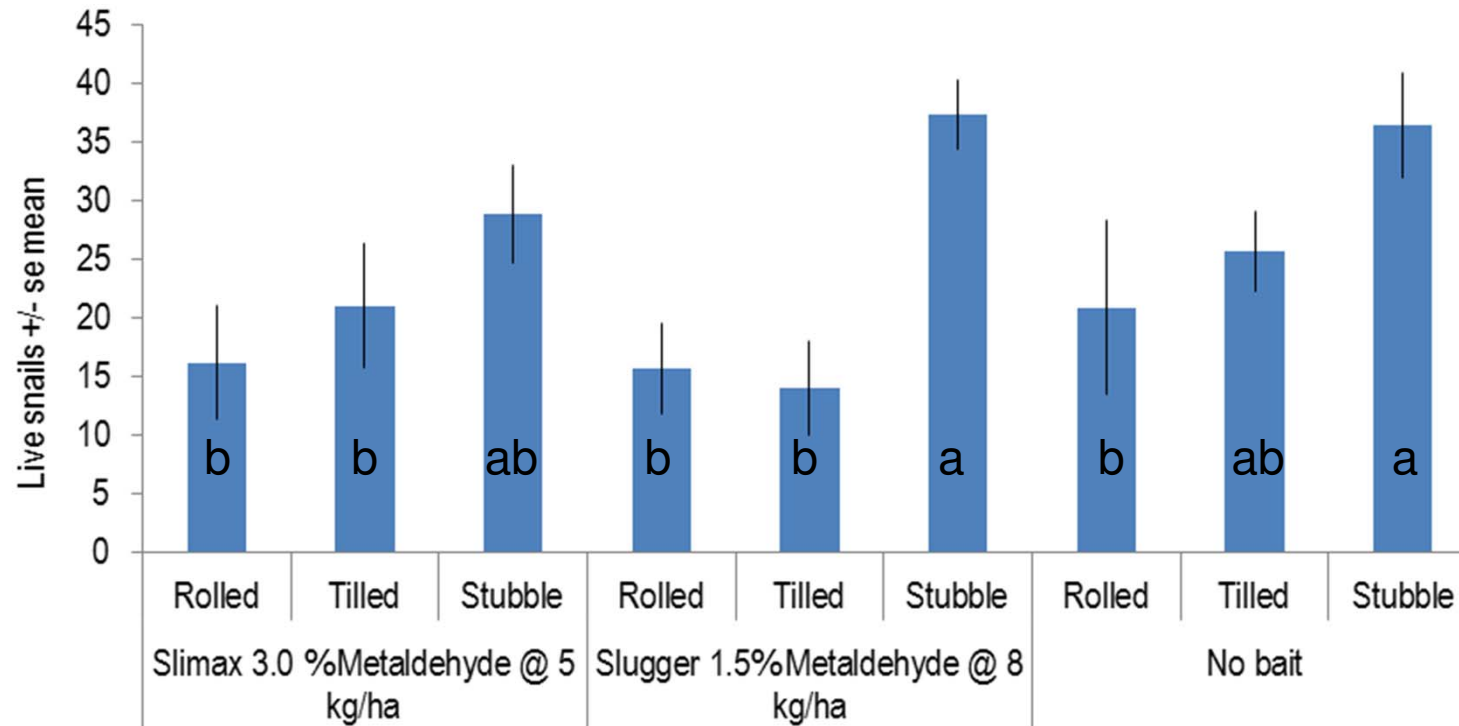
## B. Bait treatments:

1. Untreated
2. 5 kg/ha Slimax (3.0% metaldehyde), ~25 baits / sq m
3. 8 kg/ha Slugger (1.5% metaldehyde), ~20 baits / sq m

Nb. These bait rates low, less than recommended 30-50 baits per sq m for effective snail control.

# The Benefit of Summer Rolling/ Tillage.

Is there synergism benefit with baiting?



- ‘Cultural’ controls – highly significant effect ( $P < 0.001$ ) (NSD between rolling & tilling)
- Baiting – overall had no sig effect ( $P = 0.35$ )
- Interaction of Bait x ‘Cultural’ controls – N.S. ( $P = 0.06$ )  
    ➔ indication that cultural control may improve bait efficacy

# What Do We Recommend?

- Roll/cable in summer when  $> 35^{\circ}\text{C}$
- Strategic Burn
  - Windrow burning
  - Periodic whole-paddock (as needed, e.g. 3-4 year intervals)
- Grazing
- Second (lower) cut of stubble?





# Key Unanswered Questions

- Effectiveness of a 2<sup>nd</sup> cut?
- Effectiveness of a periodic tillage program?
- How to best achieve synergistic benefit from baiting and stubble management (e.g. burn, roll, tillage &/or graze)?
- Are our pesticide programs disrupting the activity of detritivores/recyclers (eg. grass-feeding termites, ants, etc) , and hence reducing the rate of stubble breakdown??



ARTICLE

Received 8 Oct 2010 | Accepted 24 Feb 2011 | Published 29 Mar 2011

DOI: 10.1038/ncomms1257

Ants and termites increase crop yield in a dry climate

Theodore A. Evans<sup>1</sup>, Tracy Z. Dawes<sup>2</sup>, Philip R. Ward<sup>3</sup> & Nathan Lo<sup>4</sup>

SARDI

Thank You

Questions? Bright Ideas?

SARDI

# Successful snail management?

*The key is year-round integrated management*

- Continuous vigilance
- Remove summer refuges
- Roll or cable in summer when  $> 35^{\circ}\text{C}$
- Bait before egg laying in autumn
  - Baiting at sowing or after often too late
- Baiting in winter is less effective
- Harvester modifications
- Grain cleaning last resort

# Features & Approx Cost of Common Baits

Product	A.I. g / kg	Label Rate kg / ha	Baits / m <sup>2</sup>	Pellet	Efficacy after rain (35mm)	Ability to spread	Distance (base on twin spinner machine) spread	Guess of cost / ha inc. spreading
Metarex®	50	5 - 8	30-50	flour	Similar	Good	22-24m	\$75.00
Metarex Micro	50	5 drilled	-	flour	Reduced	-	-	\$50.00
Metakill®	50	4-8	40-81	flour	Reduced	Good	18-20m	\$60.00
Slimax®	30	3-5	15-25	bran	Similar	not tested	not tested	\$33.00
SlugOut®	18	10	85-93	granule	Reduced	Good	24m	\$63.00
Meta®	15	7.5	18-21	bran	Reduced	Poor-fair*	20-24m	\$42.00
Slugger®	15	5 - 7.5	11-19	bran	Reduced	Poor-fair*	20-24m	\$42.00
Pestmaster®	15	5 - 7.5	13-20	bran	Reduced	Fair*	20-24m	\$42.00
Multiguard®	60	5 - 16	9-38	bran	Reduced	Poor-fair*	20-22m	\$64.00
Eradicate®	60	5 - 15	13-39	bran	Reduced	Fair*	20-24m	\$60.00
Mesuro®	20	5.5	17	bran	Similar	Poor*	not tested	\$47.00

# Harvest Management of Snails

- Header modifications
  - Rotary stripper fronts
  - Dislodger bars
  - Sieve screens/ threshing intensity
- Windrowing
  - eg. barley, best when cool and early as possible
- Grain cleaning
  - eg. Shmik roller



# Summer Control of Snails

- Stubble management
  - Grazing
  - Rolling, slashing, cabling etc
- Weed control
- Burning
  - windrow burning - can be highly effective for round snails

