IMPROVING SNAIL BAIT DISTRIBUTION

GRDC
Grains Research & Development Corporation

Alkaline Soils Group
GROWING RESULTS FOR YOU

THIS FAST TRACK PROJECT AIMS WERE

- Compare popular spreader types at optimal settings for different bait types, comparing distribution of baits across direction of travel (baits per unit area) and physical effects of spreading on baits (breakdown of pellets)
- Assess the variation in distribution of baits in the direction of travel

WHAT WAS THE PLAN?

- The project was initially raised by YPASG member, Ashley Wakefield and held at his property near Urania on Central Yorke Peninsula.
- The intensive one week trial involved sourcing of machinery, baits and staff to be available over a five day period.
- Does bait actually spread as expected?

SPREADER TYPES USED

- Bogballe
-Vicon
-Kuhn
-Amazone

BAIT TYPES USED

-Meta
-Metarex
-Slugout
-Slugga

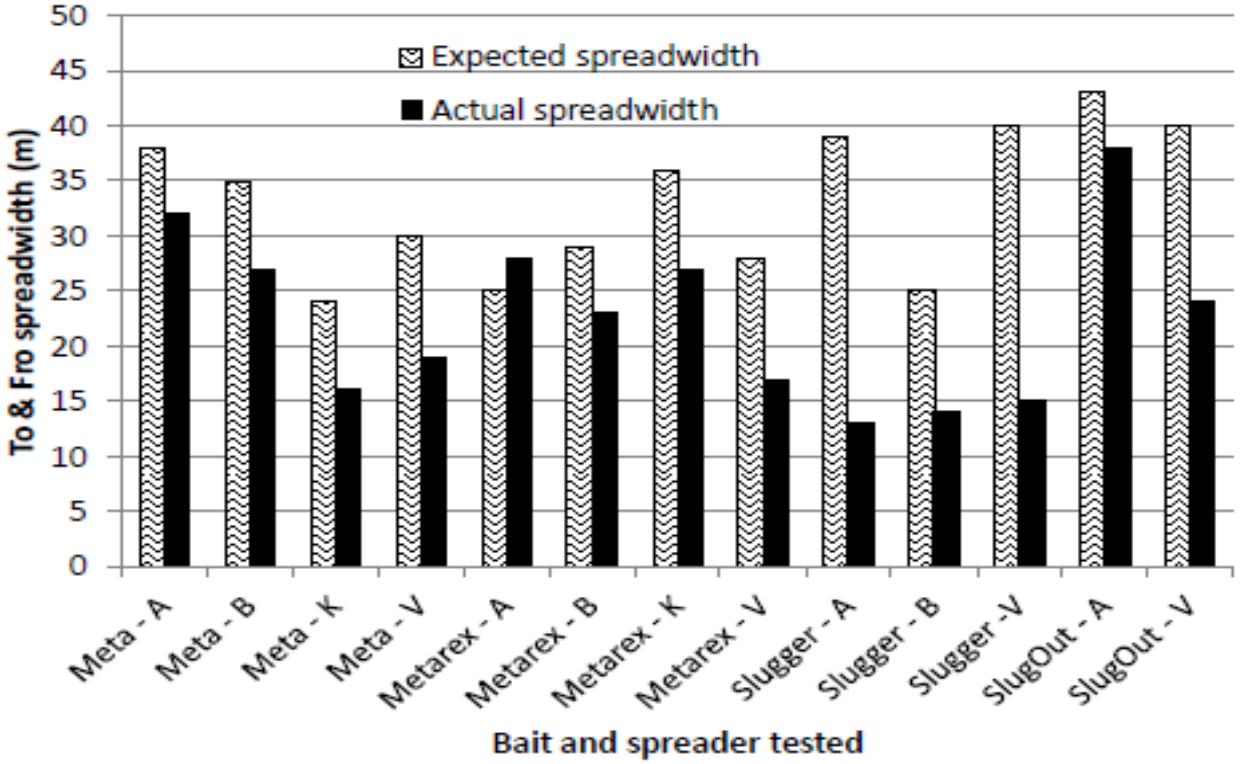
WHO WAS INVOLVED?

- Russel Nichol from Australian Fertiliser Services Association attended all week, weighing and analysing samples from each spreader/ bait combination and calculating efficiency graphs.
- SARDI entomologists Greg Baker and Helen deGraaf inspected the trial and were ultimately responsible for interpretation of graphs and bait samples and reporting.
- GRDC Ground Cover journalists interviewed those involved for extension media including Ground Cover TV article and magazine article and update of Bash ‘em, Burn ‘em, Bait ‘em.
- University of Adelaide scientists attended to oversee the scientific protocols.
- Six field assistants collected the spread baits in plastic cups and returned them to the shed for weighing and analysing.
- Property owner, Ashley Wakefield kept machinery loaded and calibrated.
- Various machinery dealers of the spreader units being assessed called in during the week.

Distribution Notes

- Bait distribution was generally highly variable across the spread width.
- Coefficient of variation (CoV) standard is 15%
- At time of testing, spread widths were calculated based on 20% CoV
- E.g. Bogballe-Meta 15% CoV = SW 15m, but at 20% CoV = 27m
- All data presented is based on spread widths calculated for ‘to & fro’ (aka ‘back & forth’) spreading.

Spreadwidth

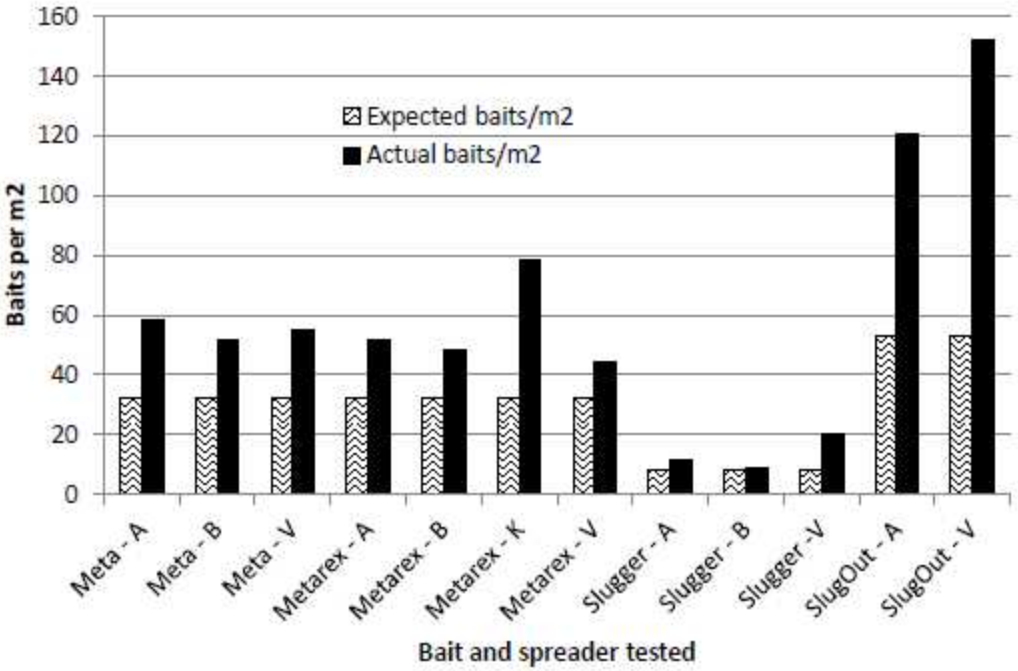


xpected spread width (m) and the actual spread width calculated with 20% coefficient of
ariance for the optimal settings for spreader/bait combinations.
= Amazone; B= Bogballe; K= Kuhn; V= Vicon.
et rates: Meta 10kg/ha (Meta-K 5kg/ha), Metarex 5kg/ha, Slugger 10kg/ha, SlugOut 5kg/ha.

Bait points per unit area

- Number of expected bait points were calculated based on # baits / kg and the set application rate (5 or 10kg/ha)
- Actual bait points determined by counting pellets collected within the spread width

Bait points per unit area



Number of bait points that should have occurred if the bait had spread at the set rate within the calculated TF spread width (Expected baits/m²) and the actual number of bait points that occurred within the TF spread width (Actual baits/m²).
Note: bait pieces <1.5mm long were not included.

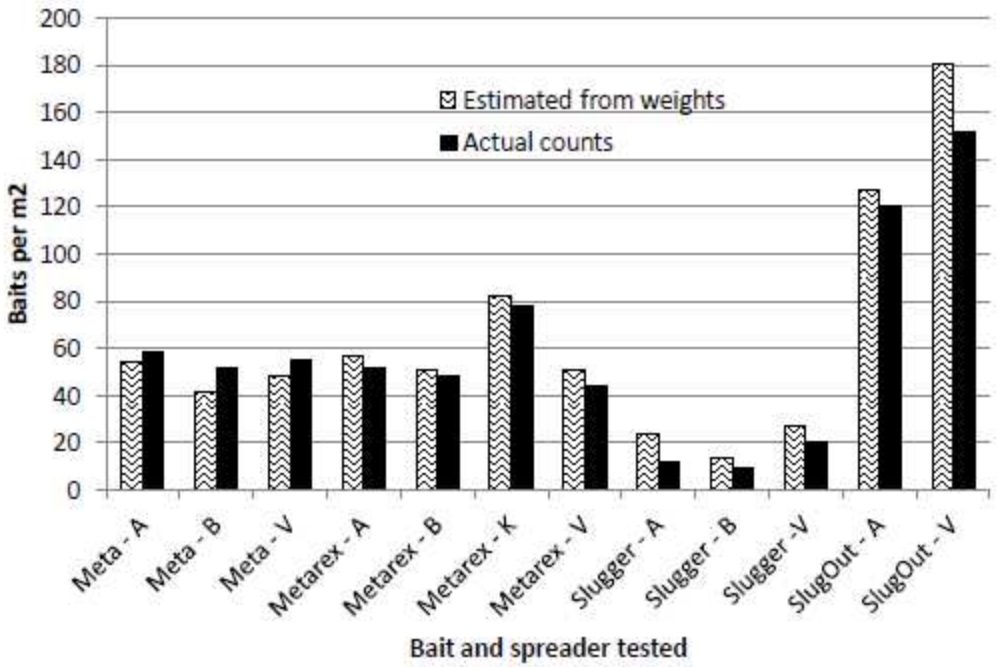
Bait points per unit area

- Number of expected bait points were calculated based on # baits / kg and the set application rate (5 or 10kg/ha)
- Actual bait points determined by counting pellets collected within the spread width
- With all spreader-bait combinations, actual baits/m^2 exceeded expected.
- Mostly caused by narrower spread widths
- Bait fragmentation increases baits per unit area

Bait fragmentation

- Baits can be broken (= more smaller baits per unit area) or shattered (= fine crumbs or powder = wasted product)

Bait fragmentation



Number of bait points estimated by multiplying actual rate by the known bait weights (Estimated from weights); and actual bait counts (Actual counts) averaged across the spread widths. Note: bait pieces <1.5mm long were not included.

Bait fragmentation

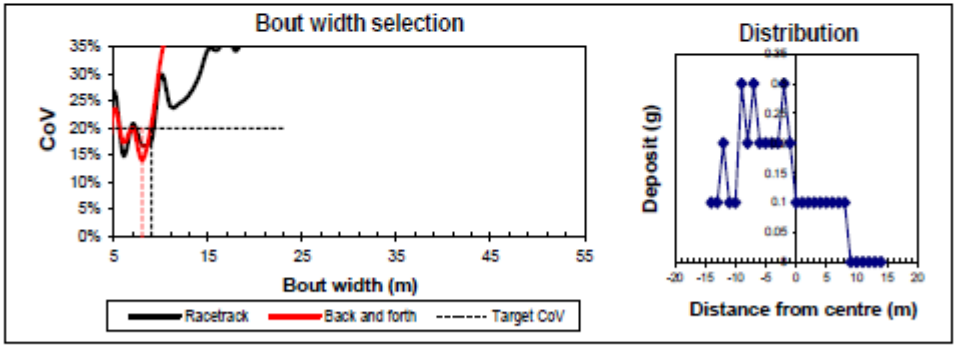
- Baits can be broken (= more smaller baits pe unit area) or shattered (= fine crumbs or powder = wasted product)
- Meta showed some fragmentation
- SlugOut result is due to the variable sized product. Some pieces are initially <1.5mm but were not counted after spreading.
- Size of bait piece effects ballistics

Ballistics

- Smaller Meta pellets are more likely to land closer to the spreader device
- Size and density of a pellet will effect ballistics and hence spread width
- Not investigated further

Ute spreaders

- Lehner and C-Dax
- Very poor performance, spread width ~8m, often lopsided.



Spread pattern obtained for the Metarex-C-Dax test.

Further spreading research ideas

- Replicate results using industry standard 15% CoV
- Density of bait pellets (pellets/kg/hl)
- Drop height and spinner RPM effects on bait distribution and integrity
- New machinery to enable spread widths >28m

This YPASG/ GRDC project was a success thanks to the cooperation of many groups and individuals, providing relevant snail control information to growers on Yorke Peninsula and beyond.
Thanks to Greg Baker (SARDI) for his assistance in providing information for this powerpoint.