



Landcare Research
Manaaki Whenua



Refining Operational Practices for Controlling Rabbits



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Introduction

- Introduced rabbits are significant pests of agriculture and environment in New Zealand
- Historically controlled by poisoning until illegal release of RHD in 1997
- Numbers are increasing again as effect of RHD wanes
- Need to reinstate widespread aerial poison control operations – most commonly 1080 (sodium fluoroacetate)







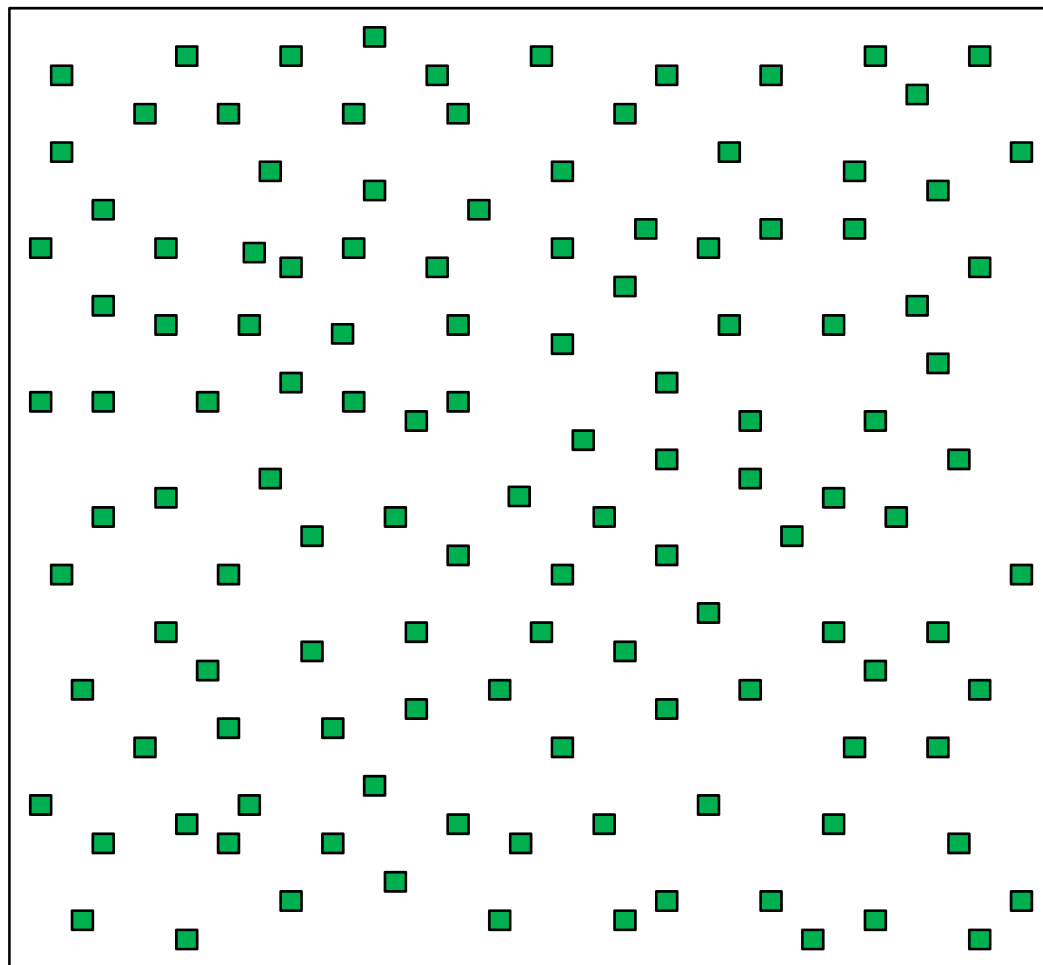
Current Practice for Aerial 1080

- 2 prefeeds of non-toxic carrot baits sown at 30 kg / ha
- 1 application of toxic carrot baits sown at 30 kg / ha
- Baits broadcast for complete coverage of treated area
- About 1 week between each application

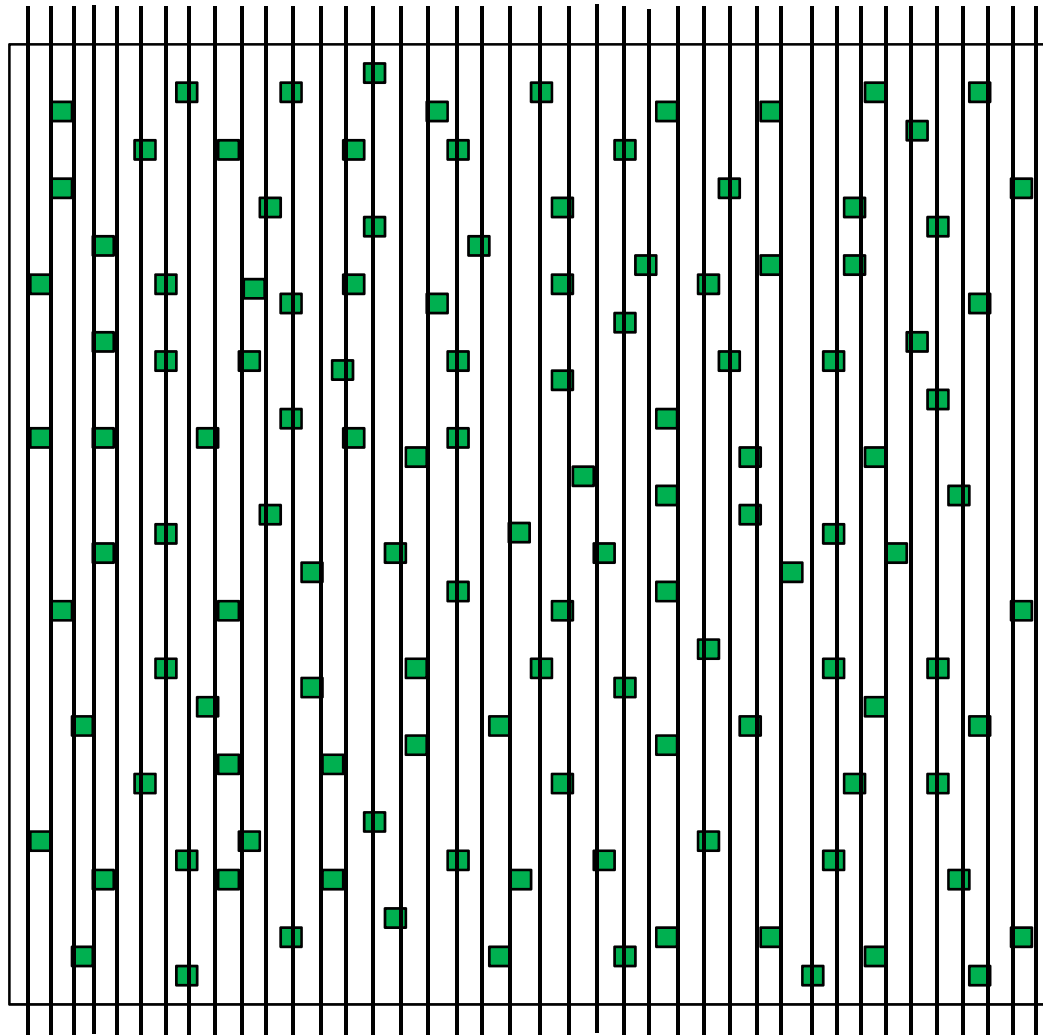
- Density of ~5,000 baits / ha for an average of about 50 rabbits / ha (max. 100 rabbits / ha)

- 50–100 baits / rabbit

- 100 ha block (1 km × 1 km) and 30 kg of bait / ha broadcast



- Fixed-wing aircraft: 40 lines 25 m apart



Current Practice

- High per ha flight time results in high rabbit control costs (\$70–\$100 / ha)
- So why do 5,000 baits need to be sown per ha?
- Why do baits need to be broadcast?
- Bait quality historically poor, i.e. highly variable bait size and toxicity (Nugent et al. 2012)
- High number of baits broadcast to maximise the likelihood that all rabbits encounter and consume a lethal quantity of bait prior to toxicosis (~20–30 min)

Experimental Trials

- Aim: reduce per ha control costs and per ha use of 1080 without a loss of efficacy
- Sow bait in strips – by increasing flight path spacing – at a reduced per ha rate



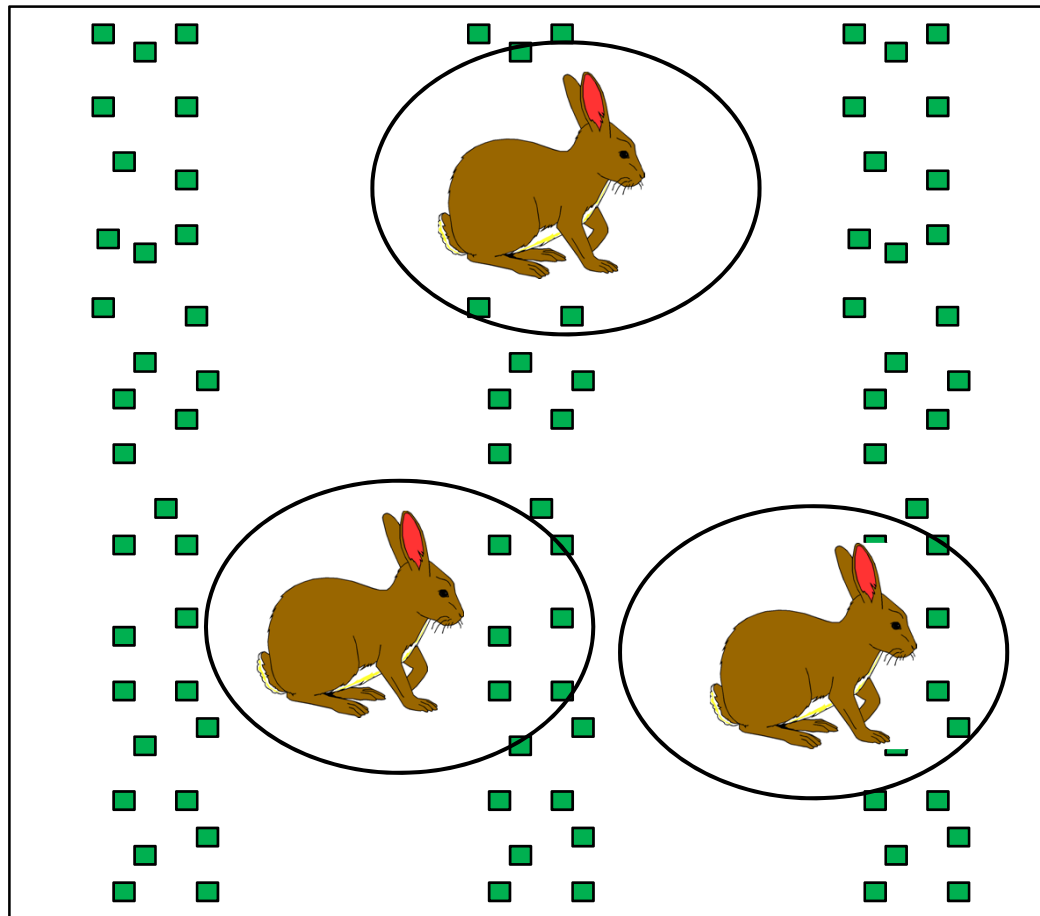
Experimental Trials

- Hypothesis: efficacy of refined operational practices will be dependent on (a.) the relationship between rabbit home range size and flight path spacing and (b.) bait density in the treated area



Experimental Trials

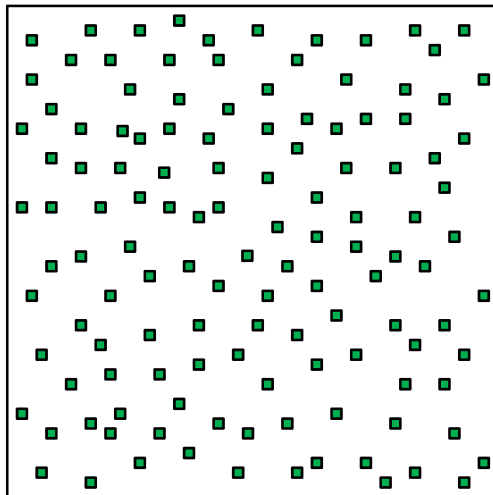
a.) All rabbit home ranges overlap bait strip



Experimental Trials

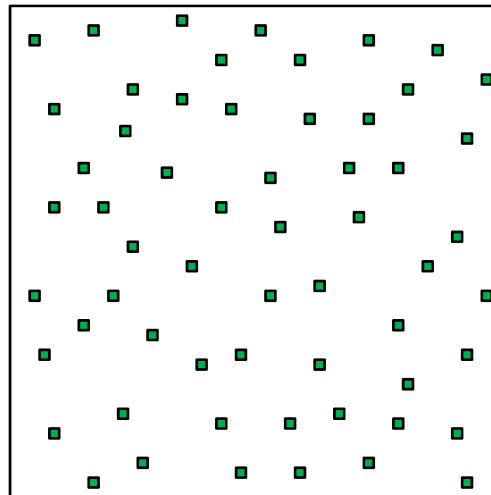
b.) Bait density within the treated area

Current practice:
~0.5 baits / m²



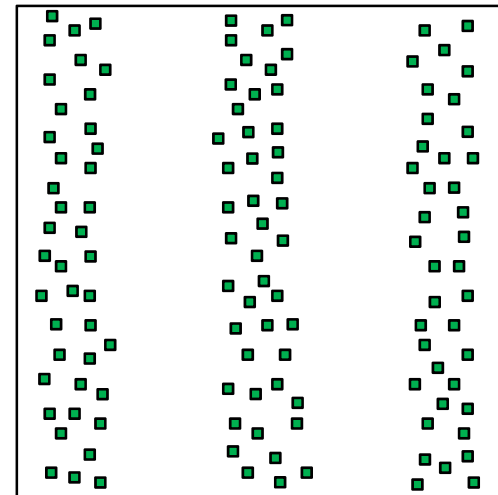
30 kg / ha

Reduced sowing
rate but broadcast:
<0.2 baits / m²



10 kg / ha

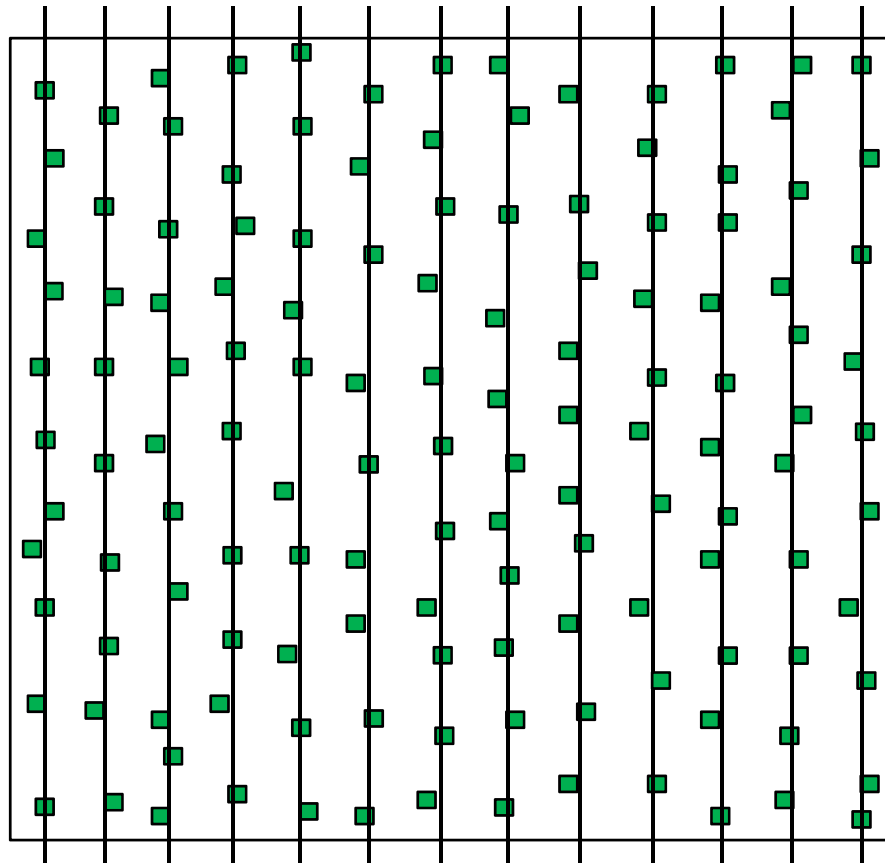
Strip sown (10 m):
~1.25 baits / m²



10 kg / ha

Experimental Trials

Per ha costs reduced using strip sowing, e.g. 75 m flight path spacing results in ~13 lines per 100 ha (c.f. 40 lines)



Experimental Trials, 2011-2012

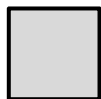
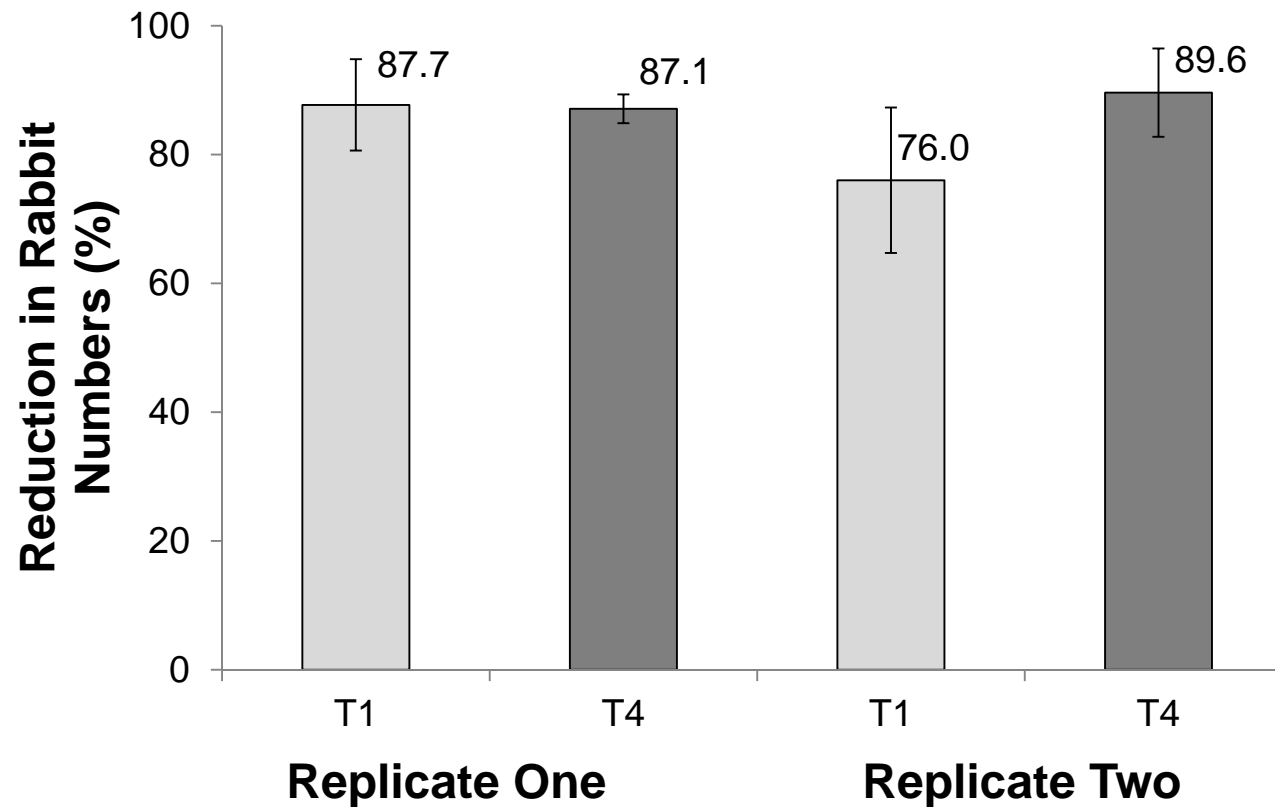
Treatment (100 ha)	Pre-feed 1	Pre-feed 2	Toxic SR (kg/ha)	Toxic SW (m)	Flight Path Spacing (m)
T1	Current Practice	Current Practice	30	Broadcast	25
T2	Current Practice	Current Practice	10	25	75
T3	Current Practice	Strip sown	10	25	75
T4	Current Practice	Strip sown	10	10	75
T4-100	Current Practice	Strip sown	7.5	10	100

Methods

- Central Otago
- Monitored using 4 × 800 m spotlight transects per 100 ha
- Dependent variable: change in the relative abundance of rabbits before and after control



2011 Trials

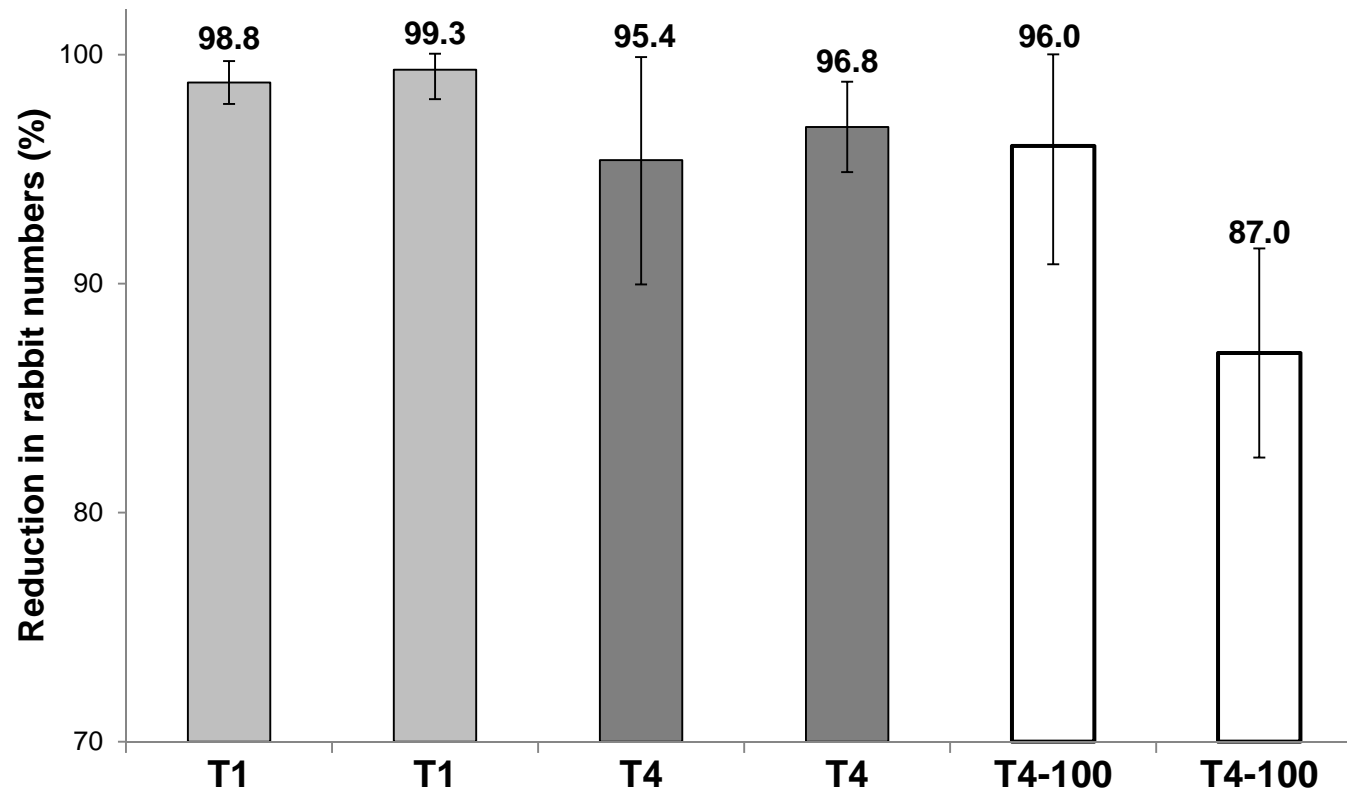


Current Practice: 30 kg bait per ha broadcast

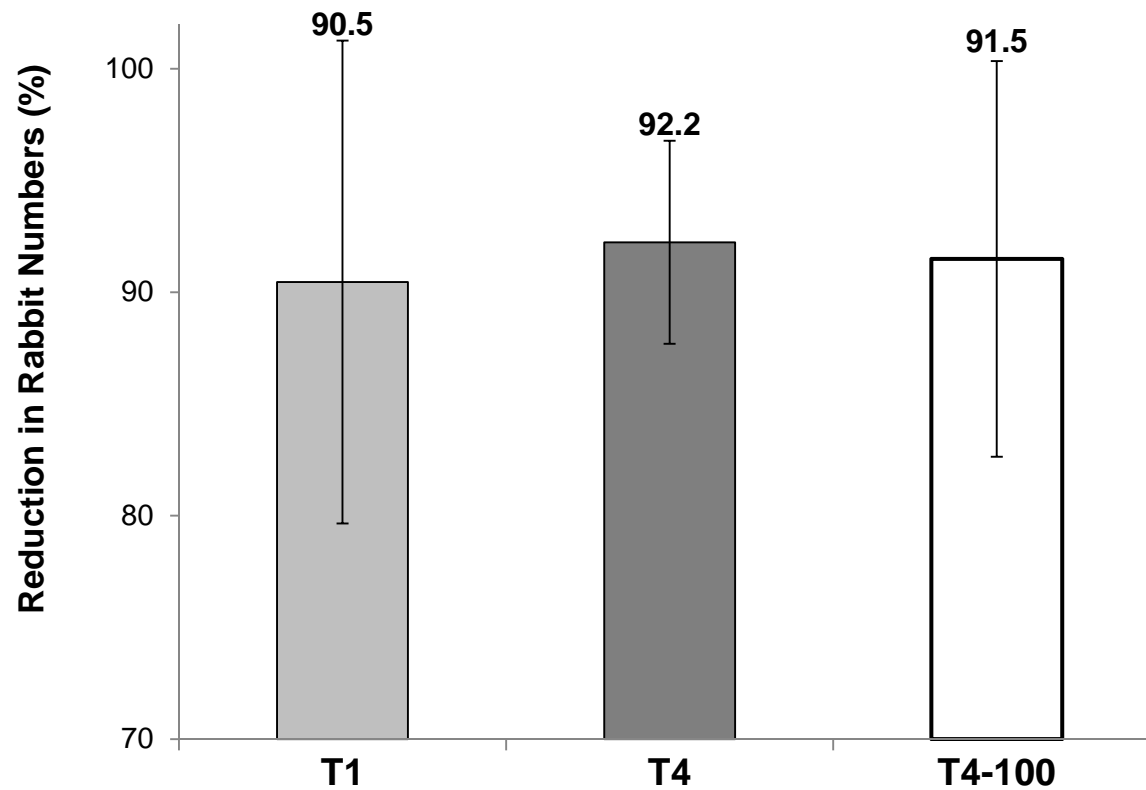


Experimental: 10 kg bait per ha sown in strips

2012 Trials



Average of 2011 & 2012 Trials



Summary

- Comparable results from current practice and T4 – based on trials from 2 years
- Suggests that T4 is a viable low-cost alternative
- Require further assessment of more 'risky' treatments

Benefits:

- 50–67% reduction in per ha control costs
- 67% reduction in bait AND 1080 sown

Acknowledgements

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- MPI Rabbit Coordination Group

