# Example ACTA field trial showing effectiveness of mouse control by registered product at three different application rates.

In view of the recent media campaign to claim that current registered broadacre mouse control products based on Zinc Phosphide (ZP) dosed at 25g/kg “do not work” and the dose must be doubled to 50g/kg, we have been asked to provide a response.

During 2010/11 ACTA conducted a series of field trails in SA, at a time of high mouse densities, with the purpose of seeking an extension of the range of application rates for MOUSEOFF, our registered product containing ZP at 25g/kg, from the approved 1kg of bait per hectare to a range of 0.5 to 2 kg/ha.

The trials all showed that the 1kg/ha application of ZP based product dosed at 25g/kg worked very well and that there was no significant advantage of increasing the rate of application of bait to 2 kg/ha. Control rates were lower at 0.5kg/ha application rates in this situation.

Due to these findings, we did not submit a claim to the APVMA to expand the dosing range.

This 2010/11 ACTA study, and several others done to a similar high standard, are known to those currently promoting the use of double dosed 50g/kg ZP product, but the findings of these studies have not been advised to growers.

Therefore, we copied below an example report and noted the following key points:

- We used multiple measures to assess mouse densities pre- and post bait application. This is important, as capture-recapture, while a recognized method, can lead to error results if traps become over-saturated and if mice move between paddocks (as they did in our study).
- The additional assessment methods included spotlight surveys (usually no live mice seen after baiting), census cards, talc marking of burrows to assess activity, and sometimes tracking boards and or uptake of individually marked grains pre and post baiting. All measures were broadly consistent but if anything, the capture-recapture gave the most conservative estimate of knockdown. It is noteworthy that few if any tagged mice were recaptured after bait application.
- We also continued assessments for a long period after the initial bait application and found that mouse numbers started to rise again over time. These were new (untagged) mice entering the area.
- As our initially captured mice were individually ear tagged, we were able to find some individual mice moving between trapping grids (typically 500m part in adjoining paddocks). This shows, that at this time of the year on the Eyre Peninsula, that mice were far more mobile than we expected. In a small number of cases, we found mice that had been tagged months before, in a trial on a different property, and even found mice to have moved several kilometers.
- Mouse densities in untreated control areas either stayed constant or went up while treated area mouse numbers dropped dramatically by all measures.

We have provided below this report (just one of several on numerous related trials) in the hope of advising our customers and merchants that there is additional data supporting the properly dosed and registered MOUSEOFF bait. Normally such in-house research reports are not made public, but since only one set of data has been promoted there is a need to expose alternate data.

ACTA Research report: **Efficacy of MOUSEOFF® Zinc Phosphide at different application rates, Test 2 Bute 2011 - MO2011/004B**

# Efficacy of MOUSEOFF® Zinc Phosphide at different application rates.

# Test 2 Bute 2011

## Research Report MO2011/004B

Animal Control Technologies Australia (ACTA)

November 2011

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# CONTENTS



ACTA

ACTA

# Table of Figures



ACTA

# Table of Tables



ACTA

ACTA

# 1 Test summary and quality assurance.

| | |
|---|---|
| **Project:** | MO2011 |
| **Study Number:** | 004B |
| **Title:** | Efficacy of MOUSEOFF® Zinc Phosphide at different application rates. Test 2 Bute 2011 |
| **Date:** | April 2011 |
| **Location:** | Bute, South Australia. |
| **Species:** | *Mus domesticus* – House Mouse |
| **Ethics / Permits:** | APVMA Permit 12503 Permit to allow research use and supply of an AGVET chemical product<br>SA - Licence to use animals for teaching, research or experimental purposes – 251 issued by Department of Environment and Heritage Exp.20/04/2012<br>SA – Permit to undertake scientific research U25857-2 issued by Department of Environment and Natural Resources – exp. 31/01/2012<br>SA - Animal Ethics Approval number 6/2010-M4. Issued by Wildlife Ethics committee Department of Environment and Natural Resources. Exp 31/03/2013<br>SA- Approval to release declared animals for research (rodentia), issued by Department of Water, Land and Biodiversity Conservation on 11/03/2010 |
| **Parameters Measured:** | Live capture trapping<br>Talc burrows<br>Canola cards<br>Spotlight surveys |
| **Summary of Major Findings:** | Average efficacy of all treatments exceeded the APVMA 70% threshold. Trapping success at the 0.5kg/ha grid was considerably lower than other measured indices for that site (46% efficacy).<br><br>Baiting at the 0.5kg/ha rate consistently resulted in lower efficacy than the higher application rates. There was no evidence to suggest baiting at the higher rate, 2kg/ha, was more beneficial than 1kg/ha.<br><br>Three mice were detected as having moved from the grid where they were first captured to another monitoring grid, two of which were from trial 1, over 7km away. |

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All treated monitoring grids recorded new individuals captured post baiting (only two mice were found to have survived baiting in treated areas).

**Recommendations:** Baiting at current label rates is adequate for the control of mice at densities around 500 mice /ha.

Longer term trapping data sets are valuable for detecting reinvasion of baited areas and providing more reliable density data. The continued use of a 5 day minimum trap assessment is recommended for future studies under these conditions.

**Principal Investigators:** Marion Atyeo (ACTA)

**Trial Participants:** Kerryn Herman (ACTA)

**Report completed by:** Marion Atyeo and Marcus Michelangeli

| | **Principle Investigator**<br>Marion Atyeo | **Research and Development Manager**<br>Ebony Arms |
|---|---|---|
| **Signature** | | |
| **Date** | | |

## 2 Permits

The current test was conducted under the following permits and licences.

- APVMA Permit 12503, MOUSEOFF® / house mouse/ assessment of efficacy of MOUSEOFF® in off-label use, Permit to allow research use and supply of an AGVET chemical product
- Licence to use animals for teaching, research or experimental purposes – 251 issued by the Animal Welfare Unit – Department of Environment and Heritage South Australia, Exp.20/04/2012
- Permit to undertake scientific research U25857-2 issued by Department of Environment and Natural Resources South Australia,– Exp. 31/01/2012
- Animal Ethics Approval number 6/2010-M4. Issued by Wildlife Ethics committee Department of Environment and Natural Resources. South Australia, Exp 31/03/2013
- SA- Approval to release declared animals for research (rodentia), issued by Department of Water, Land and Biodiversity Conservation on 11/03/2010

# 3 Executive Summary

This trial compared the efficacy of MOUSEOFF® Zinc Phosphate Bait at three application rates (0.5kg, 1kg, 2kg/ha). This was the second of three replicated trials. Two untreated controls were established to monitor natural fluctuations in mouse activity over the trial. Intensive monitoring grids were established centrally within each treatment grid and monitored for activity for five days pre and post baiting. Monitoring techniques included live capture trapping, census cards, talc burrows and spotlight census. Parameters monitored included population estimates thus density and survival probabilities using a Jolley-Seber population model, trapping success, mouse movement and survival post baiting, individual capture history and general activity changes over time.

Trapping success and other activity indices were high prior to baiting. This activity declined immediately post baiting in all treatment grids. Untreated control grids continued to record high levels of activity. Efficacy was over the required 70% benchmark set by the APVMA for acceptable population control in all treated grids.

***Table 1** Summary of results.*

| Treatment | Estimated. Density | No. individuals caught Pre Baiting | Post Baiting | Average Efficacy | Individuals known to survive treatment |
|---|---|---|---|---|---|
| 0.5 kg/ha | 451 | 112 | 50 | 79.4 | 1 |
| 1 kg/ha | 454 | 112 | 25 | 89.9 | 1 |
| 2 kg/ha | 558 | 139 | 50 | 88.7 | 0 |
| Untreated Control R5 | 549 | 152 | 136 | - | 84 |
| Untreated Control R9 | 436 | 110 | 108 | - | 74 |

861 individual mice were caught on 1967 capture occasions. Recapture rates were moderate (50-70%) for all grids and just exceeded 70% on the Untreated control grid (R5), whilst just under in R9 untreated control. Recapture rates plateau around day 5-6 of trapping.

Four mice were detected as having moved off their grid of original capture. Two of these moved between the treatment paddock and the untreated control paddock, whilst the third was detected as having moved from the trial 1 paddock into the untreated control paddock a distance of 7900m in the space of 18 days.

These moderate recapture rates and high rate of mouse movement justified the use of the Jolley-Seber open population model rather than closed population modelling for population estimates.

As a minimum, it is recommended to bait at 1kg/ha. There is no evidence a higher application rate has a better effect. Follow up at 1-2 weeks later is recommended where mouse numbers across the greater landscape are high and potential reinvasion is a problem.

# 4 Introduction

## 4.1 House mouse as an agricultural pest

Abundant populations of rodents, particularly the House Mouse (*Mus domesticus)*, can erupt in agricultural, domestic, industrial and intensive livestock situations causing serious economic and social damage (Brooks and Lavoie, 1990). Wherever food, water and shelter are present, there is always a basis for the establishment of these pest species (Lund, 1994). In agricultural situations, rodents not only damage crops resulting in a lower yield for the farmer but they can also contaminate and consume stored food items, cause infrastructure damage and pose a risk of disease transfer to humans. When climatic conditions are favourable, rodents breed rapidly and are capable of quickly forming super-abundant populations or plagues (Buckle and Smith, 1994).

House mice are remarkably adaptable, and as such are distributed throughout Australia, where they inhabit man-made structures and disturbed habitats including crops, open pasture and recently burnt forests, as well as established native vegetation (Watts and Aslin, 1981). House mice are capable of reaching incredible numbers in Australia due to the favourable climate, and lack of competitors and predators (Singleton and Redhead, 1990). In Australia a mouse plague occurs on average once in every 3.5 years and for any particular state the average is once every 7 years (Singleton et al., 2005). A mouse plague is defined as >500 mice/ha over a wide geographic area (>50,000ha) (Brown and Singleton, 1999). Reports of up to 2500 mice/ha have been made (Boonstra and Redhead, 1994) but densities are not likely to exceed this over a broad area.

## 4.2 MOUSEOFF® Zinc Phosphide Bait and its use to control mouse plague

Mouse control over broad areas was previously achieved with a variety of chemicals including strychnine and anticoagulants all of which have been banned for use in broad acre cropping systems for environmental and health reasons. The introduction of MOUSEOFF® Zinc Phosphide Bait for control of mouse populations in 1997 provided excellent immediate control with very little risk of non-target impact and no environmental residues. At present zinc phosphide is the only chemical registered for use in broad acre crops to control mice.

Zinc phosphide $LD_{50}$ values for wild mice have been reported at up to 53.3mg/kg/bw (Hone and Mulligan, 1982), but also as low as 25.8mg/kg/bw (Bell 1972 cited in (Johnson and Fagerstone, 1994). MOUSEOFF® Zinc Phosphide Bait has been specifically designed to provide an $LD_{50}$ dose of 1mg of zinc phosphide on each grain of sterilised wheat, sufficient to be lethal to an average sized mouse even at low sensitivity (maximum reported $LD_{50}$ of 53.3mg/kg/bw). At an application rate of 1kg per ha, approximately 25,000 zinc phosphide treated grains will be applied to each hectare, or 2-3 grains per square meter. A foraging mouse could easily encounter a grain at this application. The potential control, if each mouse, took two grains would be up to about 12,000 mice per ha.

The theoretical control of MOUSEOFF® Zinc Phosphide Bait is therefore up to 12,000 mice/ha. Whilst this would appear to be more than enough, there have been recent reports of bait

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needing to be reapplied frequently to gain sufficient mouse control. If mice are consuming more than their lethal dose of MOUSEOFF® Zinc Phosphide Bait this could leave other mice within a previously baited area unchallenged. In addition, mice in adjacent areas or neighbouring paddocks may also be moving into recently controlled and now unoccupied areas leading to the perception of apparent bait failure to control mouse populations.

Therefore, estimating mouse densities during plague and then monitoring the impact of control at different application rates will provide valuable insight into the practical densities MOUSEOFF® Zinc Phosphide Bait is likely to control. Furthermore, the reinvasion rates of controlled fields, when adjacent fields are not controlled, are also very important to understand. Farmers who attempt control of mice in broadacre situations but are adjacent to neighbours who don't bait, may have continuing problems, and what may look like product failure is actually a reinvasion of mice into a now unoccupied area. A better understanding of these processes may lead to improved baiting strategies.

This trial represents the second in a series of three replicated trials. For results on the other two trials see Report MO2011/004A and Report MO2011/004C.

# 5 Aims

1. To evaluate the efficacy of MOUSEOFF® Zinc Phosphide Bait against *Mus domesticus* at a variety of application rates (0.5, 1, 2kg/ ha) within a range of mouse densities (moderate – extreme). Replicate 2 of 3 trials.
2. To gather some basic population data that can be used to better assess experimental methodology, the structure of populations under high density conditions and how populations respond to baiting.

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# 6 Methodology

## 6.1 Field Site

Work was conducted in a homogeneous wheat stubble paddock 5km South of Bute on the Yorke Peninsular, South Australia. The 150 ha paddock was divided into 3 plots of approximately 50 ha each. One of three MOUSEOFF® Zinc Phosphide Bait treatments was allocated to each plot, and non-treatment control plots were established in an adjacent wheat stubble paddock with a similar harvest and management history. The untreated controls were within a 115ha paddock divided into four plots of around 28ha each, however only two plots were used during this trial. A monitoring grid was centrally placed within each plot, located no closer than 200m from the nearest fence line, and spaced as far as possible from monitoring grids in adjacent grids.

Trials began on the 19th of April 2011 and concluded on the 5th of May 2011.

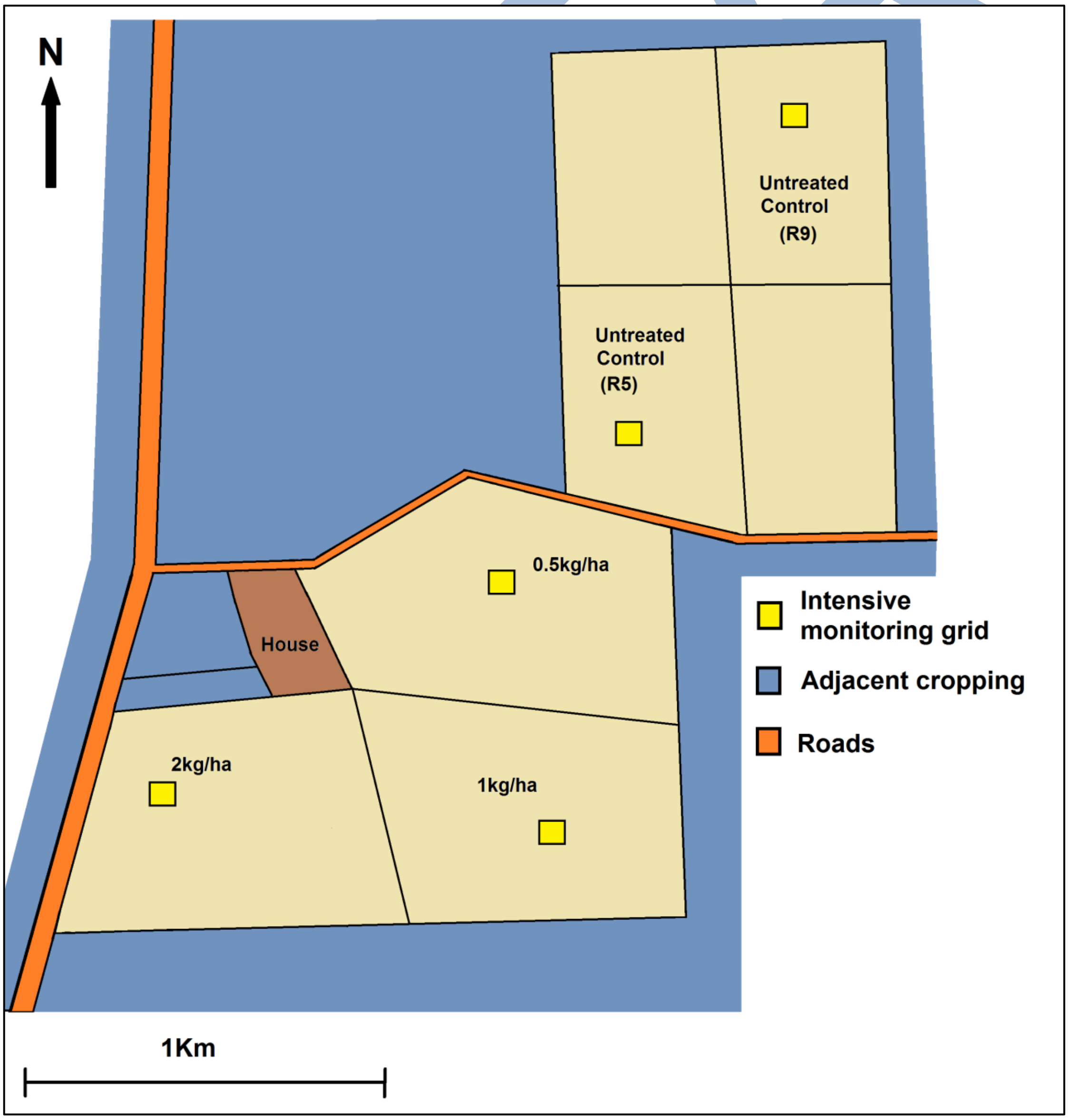


***Figure 1*** *Trial layout of Efficacy testing*

## 6.2 Mouse population and activity monitoring

A combination of abundance indices were used to determine mouse activity within each site:

- Live capture trapping
- Census chew cards
- Talc Burrows
- Spotlight census

Each index was established within an intensive monitoring grid centrally located within each treatment area. Special attention was made to ensure monitoring grids were spaced as far away from each other as possible (closest two grids were 698m apart) and grids were a minimum of 200m from the nearest fence line. The monitoring grids were approximately 40m x 40m but were assumed to cover a sampling area of 50m x 50m or 0.25ha.

### *6.2.1 Live capture trapping*

A 5 x 5 grid (n = 50, two traps per station) of Longworth live capture traps were deployed and spaced 10m apart. Traps were baited with sterilised whole wheat grain and insulating harbourage was provided in the back of the trap (synthetic cushion stuffing and a corn starch based Styrofoam). Traps were checked daily from dawn and mice captured were marked with individual Hauptner brass ear tags prior to release at the point of capture. Gender, reproductive status, general body condition, and capture/recapture status was recorded before release at point of capture. Traps found closed, without a successful capture, were marked as a trap fail. Where traps were unable to be triggered shut leaving trap doors open the trap was considered a malfunction for the night and either repaired or replaced. Traps chewed through by mice which subsequently escaped were counted as a trap malfunction.

***Figure 2*** *Longworth trap*

After 5 days of trapping (pre-baiting period), the traps were closed for MOUSEOFF® Zinc Phosphide Bait treatment application. Traps were reopened 3 days after baiting. The 3 day break between baiting and trapping allowed enough time for mice to find the bait without the competitive influence of free feed in the traps. When traps were re-opened for post baiting assessment the same procedure during the first 5 days of trapping was repeated to determine how the treatment influenced the population at each site.

### *6.2.2 Trapping success*

Trapping success was calculated for each monitoring grid for each day. This was calculated as the number of mice captured divided by the number of trap nights (as per the following equation). Trap nights were equal to the number of set traps each night minus half a trap night for each trap fail (this took into account those traps that were closed but failed to capture any mice).

$$Trapping\ success = \frac{No.mice\ captured}{No.of\ trap\ nights}$$

where, $Trap\ Nights = No.of\ traps\ set\ per\ night - \frac{1}{2} trap\ night\ for\ each\ trap\ fail.$

**EQUATION 1.**

### *6.2.3 Census cards*

Census cards were used in assessing the activity of mice, by the creation of a general activity index (Engeman and Whisson, 2006). Census cards are comprised of a thick paper card lined with a 10 x 10 cm grid, which is soaked in attractant oil and staked in a row within a proposed treatment site and left overnight.

***Figure 3*** *Census card in the field*

A grid of canola soaked census cards was established for one night during the pre- and post-baiting period, to determine if there was an evident drop in mouse activity after baiting. A grid consisted of 4 rows of 5 cards (n = 20) spaced approximately 10m apart. Cards were soaked in canola oil overnight then staked into the ground using a bamboo skewer with flagging tape attached. The number of squares from each card chewed out was counted the following day. Where chewing was evident but only part of the square was removed, this was valued as half of a square.

### *6.2.4 Talc Burrows*

***Figure 4*** *Active mouse hole (right) detected using talc dusting*

The count in the change of active burrows post baiting is a technique used to determine baiting success in a number of rodent species (Mathur and Prakash, 1983, Engeman and Campbell, 1999, Engeman et al., 1999) Ten burrows were selected within the monitoring grid, flagged and dusted with talcum powder. Burrows were checked every day for four days pre and post baiting and were considered active if the talcum powder appeared disturbed by mouse movement or inactive if no disturbance was apparent.

### 6.2.5 *Spotlighting surveys*

A spotlight survey was undertaken on all grids approximately 2h after dark for three nights pre and post baiting. A 100m transect was staked out in parallel with the intensive monitoring grid but approximately 10m outside of the grid. A single observer walked slowly along the transect and recorded the number of mice observed within 1m either side of the transect. Each transect took 10 minutes to complete. The same observer was used for all observations on all grids on all days to minimise potential variation between observers.

## 6.3 Estimating population size per hectare

Population density estimates and survival probability estimates were based on the capture/recapture data collected during the trapping periods. Estimates of density and survival probability were calculated using the Jolly-Seber method for population estimates – a method designed for open populations: it takes births, deaths, migration and emigration into account, providing a more biologically realistic test, unlike closed population estimates (Krebs, 1994). It should be noted the values given are only estimates of the monitoring grid rather than the whole site. This method cannot take into account the potential patchiness in distribution of mice across a field.

This method was selected as the assumptions of population closure could not be made during this study. Many attempts to estimate abundance of rodents rely on short capture periods from which to generate capture data for population modelling estimates (2-3 days). For such short periods assumptions of closure can be made when populations are largely site attached with relatively small home ranges. However, during this study the observations of large scale rapid movement by individual mice suggest little site attachment and large scale ranges or mostly nomadic populations with no set home ranges thus violating assumptions of population closure at the scale of trapping undertaken. This is supported by the low rodent recapture rates achieved over a 5 day trapping period prior to baiting.

Although the entire 10 day trapping period was used to model all parameters, estimates for populations size are more realistic if the average of the middle three tapping periods for pre and post baiting periods was utilised. The sudden removal of the resident population and slow reinfiltration of new mice is perhaps a cataclysmic scenario that this model was never designed or tested for despite its claim to take emigration and deaths into account. Thus survival probabilities are reported over the entire period but population size and density estimates rely on the most appropriate subset of the data. This subset collection of data did not have to hold for the untreated control sites where the estimates are derived from all data that was calculable.

### 6.3.1 *Estimation of population decline using indices*

Efficacy is measured in terms of the percentage change in population size or activity. The activity indices used in this trial have been developed as controlled experimental designs, where populations are paired to reduce biases associated with ecological variables. In this trial, the control grid served to assess natural changes in the rodent population compared to treatment grids (baiting with zinc phosphide formulations). The following equation (Henderson and Tilton, 1955) cited in (Cowan and Townsend, 1994) was used to assess efficacy between each treatment type and the control:



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Efficacy b/w treatment types & control = 100 x (1 – [(T2 x C1) / (T1 x C2)])

*Where: C1 = Control site values pre; C2 = Control site values post; T1 = Treatment site values pre & T2 = Treatment values post.*

**EQUATION 2.**

Efficacy measurements were calculated using trapping data (trapping success and population estimations) and activity data from census cards, talc burrows and spotlighting.

### *6.3.2 Rodent survivorship*

Rodent survivorship was estimated using the Jolley-Seber population estimation for open populations. This model allows for the calculation of a survival probability from one trapping period to the next. Before data could be interpreted a zero truncated Poisson test for equal catchability was applied (Caughley, 1977). However, the test for equal catchability was applied to the pre baiting trapping period only as the test is invalidated by the removal of animals from the study grid either by immigration or mortality. We assume the presence of bait does not affect the catchability of individuals who have not consumed bait. We also assume no sub-lethal poisoning, thus we can ignore any meaningful change in behaviour from the consumption of bait as animals have died, shortly thereafter.

The number of mice surviving baiting was also noted by examining the individual capture histories of mice caught post baiting.

## 6.4 Baiting and bait uptake monitoring

Each treatment area was baited to either 2 kg/ha, 1kg/ha, 0.5kg/ha or 0kg/ha (untreated control) with MOUSEOFF® Zinc Phosphide Bait. Farmers spread the bait using a calibrated fertiliser spreader on the back of a tractor. Bait was applied on the afternoon of the 25th of April. Bait uptake was monitored on four sub-plots per treatment area. Each sub-plot was approximately 1.2m x 0.75m, cleared of vegetation smoothed and flattened and then 5 shallow holes were made in the grid (Figure 5).

***Figure 5*** *MOUSEOFF® Zinc Phosphide Bait grain within a hole of the bait uptake grid*

A single grain of MOUSEOFF® Zinc Phosphide Bait was placed in each hole, and monitored daily for 8 days. Bait taken was not replaced. Once bait had been removed the hole was smoothed over to indicate a taken bait for the remainder of the monitoring period.

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***Figure 6*** *Bait uptake plot*

## 6.5 Non-target monitoring

No non-target monitoring was conducted formally for this trial due to no suitable adjacent habitat or thick shelter belts around the treated paddocks. Treatment paddocks were surrounded by other paddocks of similar usage, or the homestead property with sheds and other farm building infrastructure. The farmer reported no raptors nesting in or around these buildings.

## 6.6 Post trial follow up with snap traps

Snap traps were deployed within the baited areas of this trial as a post trial follow up to monitor mice within the treated areas. Snap traps were deployed in the 1kg/ha and 2kg/ha treatment areas in a 4 x 4 grid pattern (n=16, 10m spacing between all traps) for one night on two occasions. On a single occasion, traps were deployed in a single trap line (n=10 with 10m spacing between traps) in all treatment areas overnight. On all occasions snap traps were deployed in different areas of the treatment grid. Snap traps were not deployed in or through the areas where intensive monitoring grids had been placed. The trap lines could be compared to data taken prior to trial commencement during pre trial assessment of numbers to determine if trials were warranted in a particular paddock.

## 6.7 Reporting of results timeline

All daily monitoring activities are reported in relation to the date of baiting. The date of baiting is day zero. All days prior to Day 0 are labelled as day negative to this day (the day before is day -1 two days before is day -2 etc.). Days after baiting are labelled positive to this (the day after baiting is day 1 two days after baiting is day 2 etc.), which allows better comparison of trial data with previous and subsequent trials as not all trials have the exact number of days of monitoring or days between baiting and first day of data collection post baiting.

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# 7 Results

Results are divided into the following sections:

1. **Efficacy:** This includes all monitoring indices such as trapping success, density estimates, census cards, talc burrows and spotlight counts.

2. **Observations on population structure and dynamics:** This includes survivorship, recapture rates cohort recaptures and population structure. This additional information, collected during normal data collection surveys, supports the validity of methods of analysis selected and helps to detect confounding effects. It can also help to support the interpretation of data through the understanding of mouse behaviour.

3. **Mouse movements:** This includes the trapping history of individual mice and shows how they move within a trapping grid or between them. These are observations on mouse behaviour including the level of site attachment and the likelihood of mice moving into the treatment areas from adjacent areas.

4. **Bait uptake:** Data from bait uptake grids

5. **Non-target observations:** Data gathered on non-target species throughout the trial.

6. **Post trial follow up**: Data from snap trapping post trial as an indication of the longevity of population control.

## 7.1 Efficacy

### *7.1.1 Index 1. Trapping success*

Over the entire study, 1967 captures were made consisting of 861 individual mice. During pre baiting, 1,204 mice were captured consisting of 625 individuals. Post baiting had a total of 763 captures consisting of 403 individuals of which 228 (56.5%) were new individuals not previously seen during pre baiting. Only two of the individuals captured post baiting on treated grids were also caught pre baiting (survivors). The remainder of previously caught individuals were from untreated control areas.

Trapping success was characteristically low on the first day of trapping. On day -3 average, trapping success rose to over 90% (under plague conditions, this is usually observed on the second day trapping).

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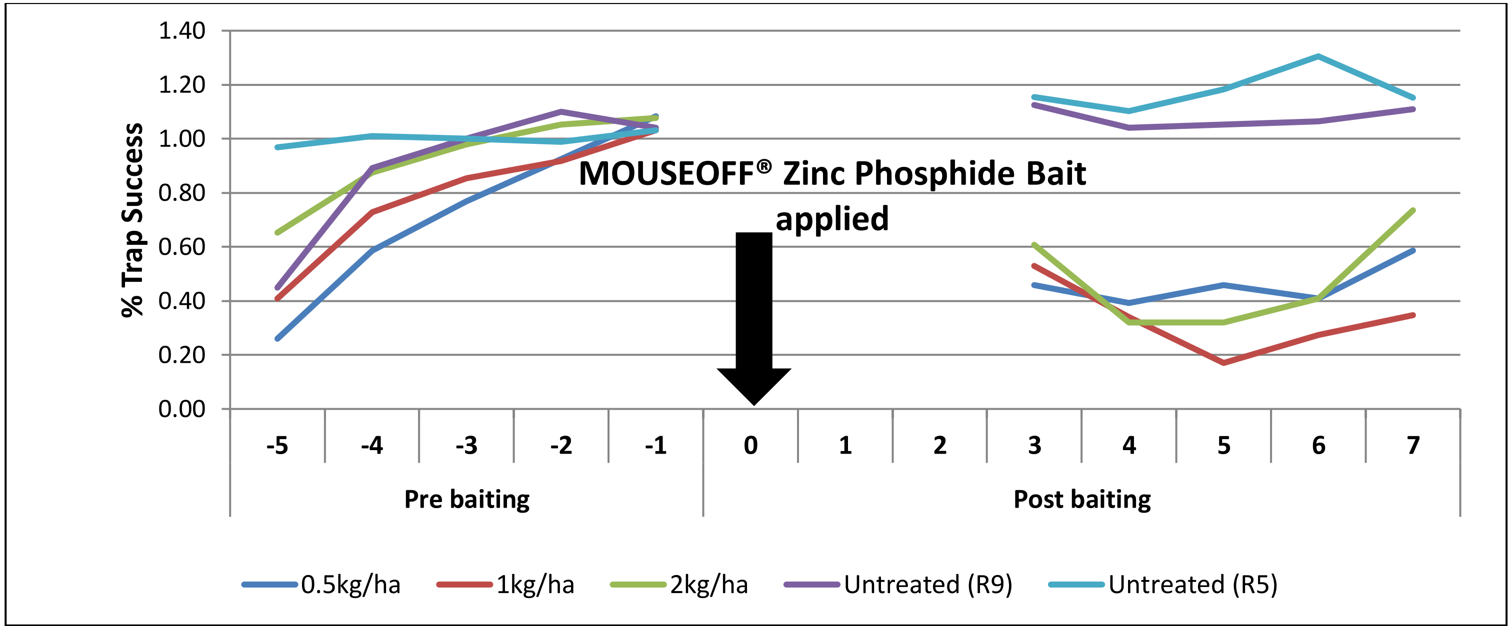


***Figure 7*** *Trapping success across entire study*

***Table 2*** *Percentage trapping success over pre and post baiting periods*

| Treatment (kg MOZP/ha) | PRE BAITING (%) | | | | | POST BAITING (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | -5 | -4 | -3 | -2 | -1 | 3 | 4 | 5 | 6 | 7 |
| **0.5 kg/ha** | 26.0 | 58.6 | 76.8 | 92.5 | 108.3 | 45.8 | 39.2 | 45.8 | 40.8 | 58.7 |
| **1 kg/ha** | 40.8 | 72.7 | 85.4 | 91.8 | 103.1 | 53.0 | 34.0 | 17.0 | 27.3 | 34.8 |
| **2 kg/ha** | 65.3 | 87.5 | 97.9 | 105.2 | 107.7 | 60.9 | 32.0 | 32.0 | 40.8 | 73.5 |
| **Untreated Control (R9)** | 44.9 | 89.1 | 100.0 | 110.0 | 104.0 | 112.5 | 104.2 | 105.1 | 106.5 | 110.9 |
| **Untreated Control (R5)** | 96.8 | 101.0 | 100.0 | 98.9 | 103.1 | 115.4 | 110.2 | 118.4 | 130.5 | 115.2 |

Greater than 100% trapping success occurred when traps caught more than a single mouse per trap. There were notable occurrences of multiple captures/trap occurring. The frequency of which these multiples captures occurred during this trial indicate mice have switched to a more gregarious social system. Multiple captures occurred as per the following:

| | |
|---|---|
| Two mice per trap | 73 occurrences (4.3%) |
| Three mice per trap | 11 occurrences (0.64%) |
| Four mice per trap | 2 occurrence (0.12%) |

As shown in Figure 7 above trapping success remained high within both untreated control areas (over 100%) during the post baiting period, whereas trapping success declined sharply in all treated areas. Trapping success in the 0.5kg/ha treatment site did not decline to levels as low as those recorded in the 1 and 2kg/ha sites, dropping to 39.18% (knockdown efficacy of 52.1%), then rising to 58.7% by the end of the monitoring period. The trapping success in all treated areas showed an increase in the last two days of monitoring.

Overall efficacy using trapping success as an index was calculated as the average pre baiting (excluding day -5 first day of trapping) and the value from the 5th day post baiting. Efficacy was highest within the 1kg/ha grid and lowest within the 0.5kg/ha grid. The 2kg/ha grid had lower efficacy than the 1kg/ha grid.

***Table 3** Baiting efficacy at different application rates calculated at 5 days post bating*

| | Pre | Post | % Efficacy |
|---|---|---|---|
| **0.5kg/ha** | 84.04% | 45.83% | 50.17 |
| **1kg/ha** | 88.28% | 17.02% | 82.42 |
| **2kg/ha** | 99.58% | 32.00% | 70.58 |
| **Average Untreated Control** | 100.78% | 111.70% | |

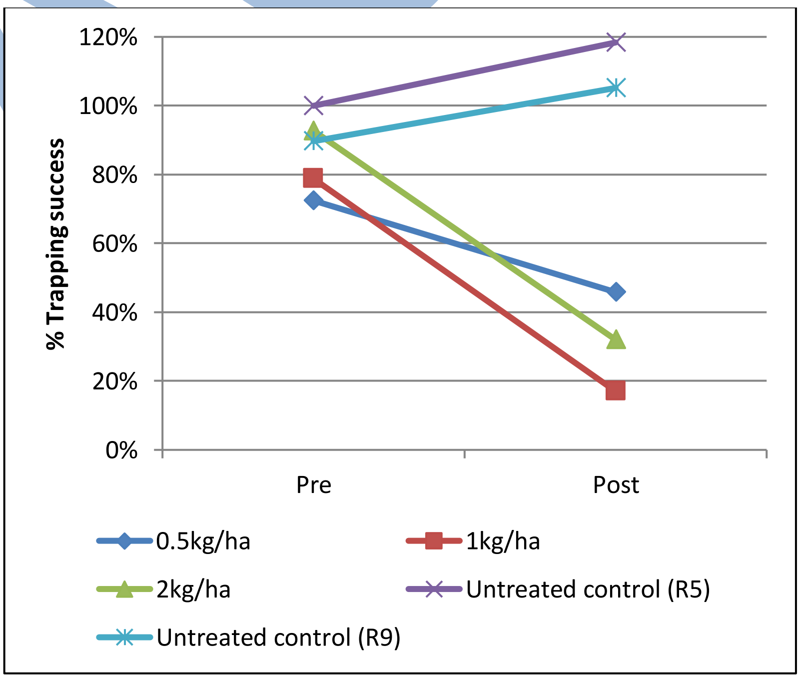


***Figure 8** Average trapping success showing treatment effect compared with controls (BACI model.)*

### 7.1.2 *Index 2. Density estimates*

All capture recapture models assume individual mice are equally catchable (Caughley, 1977). A test of this assumption was performed using a zero truncated Poisson test for equal catchability performed using pre baiting data only for all areas. Post baiting data was assessed separately using the same test in untreated control areas but due to the effects of baiting and the massive disruption to the population in treated sites (due to bait application) this test was not suitable (Krebs, 1994). In these treated areas a Leslie Chitty and Chitty test was performed where possible. The test for equal catchability found no significant differences in any grid tested pre baiting (Table 25 and 26 – Appendix 10.3.1).

Jolly-Seber estimates indicate average mouse densities ranged between 436-558 individuals per hectare across sites prior to baiting with MOUSEOFF® Zinc Phosphide Bait. This is a conservative estimate and is representative of the trappable population only. Trap saturation was recorded after the first day of trapping, thus population estimates may have been larger if more traps had been deployed on monitoring grids (though not practical due to time constraints and logistics of running such extensive and replicated trials). After baiting, mouse activity significantly decreased in the treatment grids indicating a decrease in the population. The 0.5kg/ha treatment's population estimate decreased from 451 individuals/ha to 107 (80.6% efficacy). In the 1kg/ha grid, population estimates decreased from 454 to 23 individuals/ha – 95.8% efficacy. The 2kg/ha treatment found population estimates decreased from 558 to 35 individuals/ha (94.8% efficacy). In the control grids, population estimates increased in R5 from 549 to 637 individuals/ha but a slightly decreased in R9 from 436 to 460 individuals/ha (see Table 3).

When compared statistically, the estimated mouse population significantly decreased in the treatment grids when compared to the control (Control - 0.5kg: $t=0.154$, $p= <0.001$; Control - 1kg/ha: $t=2.24$, $p= <0.001$; Control - 2kg/ha: $t=3.02$, $p= <0.001$). There was no significant difference between the treated grids.

***Table 4** The number of mice tagged and the estimated population size per hectare*

| Treatment | Pre baiting | | | Post Baiting | | | Change in density estimates | Efficacy of treatment |
|---|---|---|---|---|---|---|---|---|
| | No. of mice tagged (n) | *No. capture occasions (n) | Estimated population density / ha | No. of mice tagged (n) | *No. capture occasions (n) | Estimated population density / ha | | |
| **0.5kg/ha** | 102 | 175 | 451 | 52 | 114 | 107 | -344 | 80.64% |
| **1kg/ha** | 103 | 191 | 454 | 25 | 43 | 23 | -431 | 95.86% |
| **2kg/ha** | 122 | 220 | 558 | 43 | 56 | 35 | -523 | 94.88% |
| **Untreated control (R5)** | 135 | 398 | 549 | 136 | 286 | 637 | +88 | - |
| **Untreated Control (R9)** | 106 | 220 | 436 | 105 | 256 | 460 | +24 | - |

* Represents the number of occasions on which tagged animals were caught.

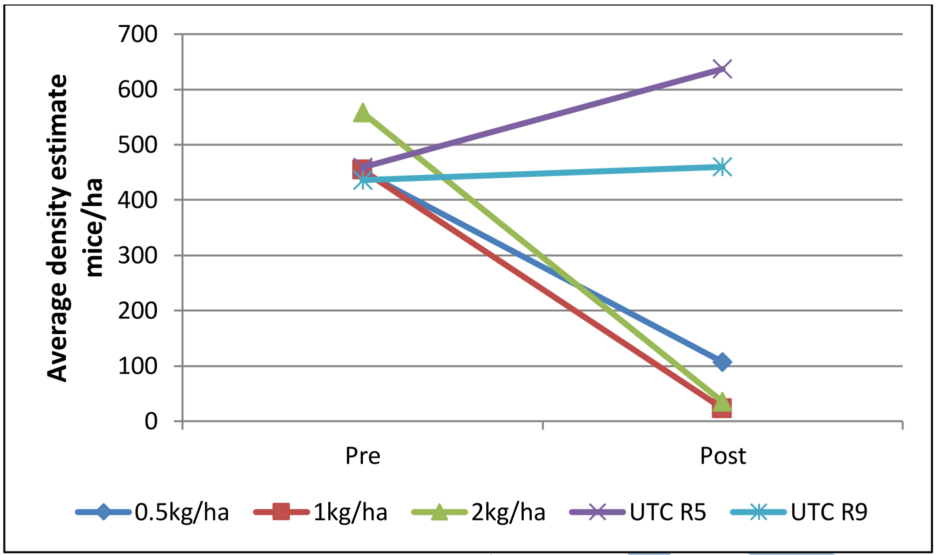


***Figure 9*** *Average density estimations showing treatment effect (BACI model).*

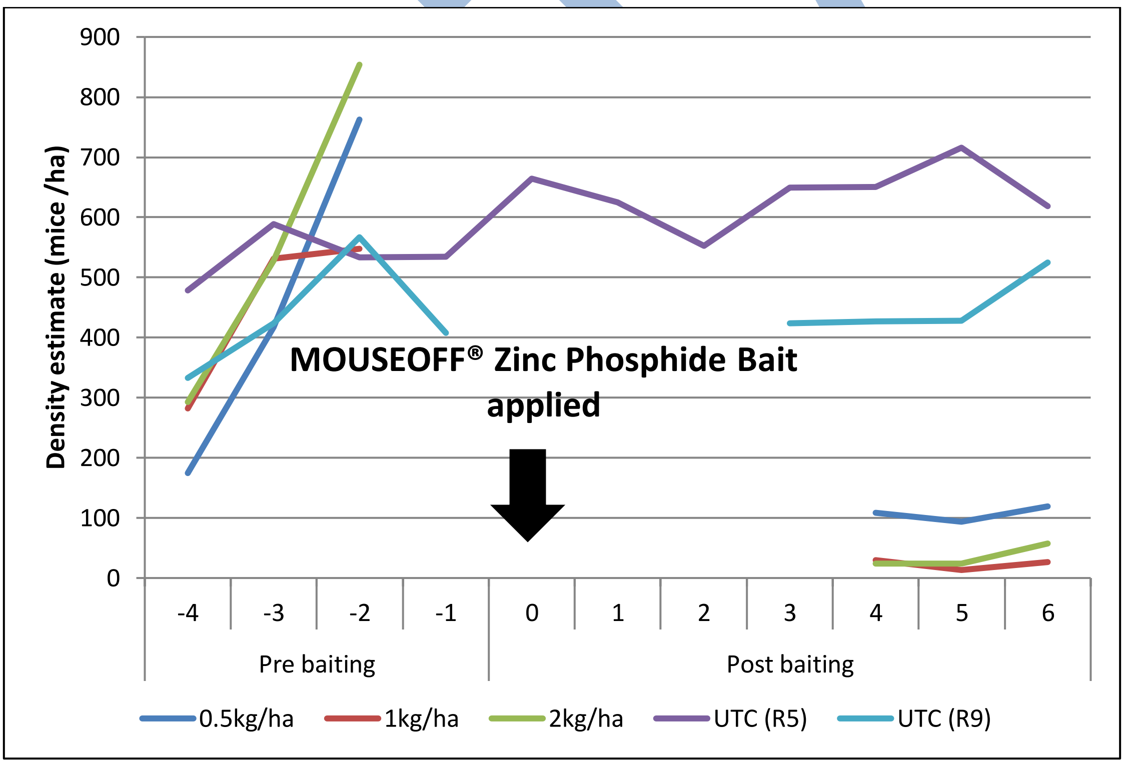


***Figure 10*** *Estimated mouse population per hectare before and after baiting with MOUSEOFF® Zinc Phosphide Bait rodenticide. Trapping did not occur during the baiting period (indicated by the black arrows) in R9 - untreated control.*

### 7.1.3 *Index 3. Census cards*

All treatments performed similarly with greater than 99% efficacy (Table 5). Mouse activity on census cards decreased dramatically during the post-bait period, particularly amongst the treatment grids (significant difference between pre and post baiting periods, p=<0.001). In contrast, the control grid values remained constant pre and post baiting though some decline was noted in the R5 untreated control area.

***Table 5*** *Census chew card activity. Efficacy corrected for control based on the quantative measure of census chew cards and the average of untreated control values.*

| Treatment (kg MOZP/ha) | Pre-baiting | Post-baiting | % Efficacy Average of controls |
|---|---|---|---|
| **0.5kg/ha** | 32.6 | 0.25 | 99.2 |
| **1kg/ha** | 16.7 | 0.025 | 99.8 |
| **2kg/ha** | 29.525 | 0.025 | 99.9 |
| **Untreated Control (R5)** | 25.05 | 18.35 | - |
| **Untreated Control (R9)** | 56.4 | 60.65 | - |

There was a decline in activity in the R5 untreated control (-26%), though untreated control R9 recorded an increase of +7.5%. Associated with the average untreated control activity, the corrected for control decline for all the treated grids was over 99%.

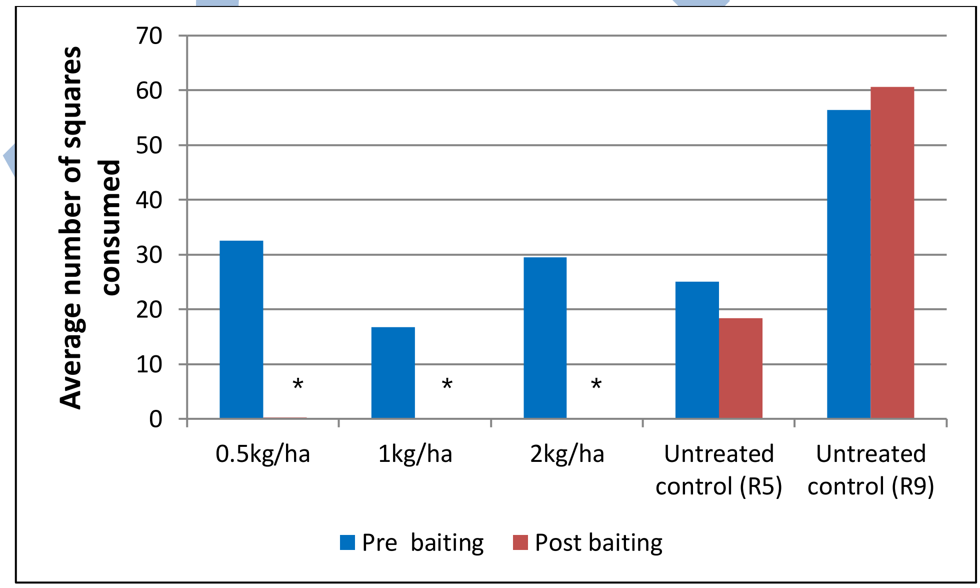


***Figure 11*** *Mean number of squares of census cards eaten pre and post baiting with MOUSEOFF® Zinc Phosphide Bait rodenticide. * = near zero value.*

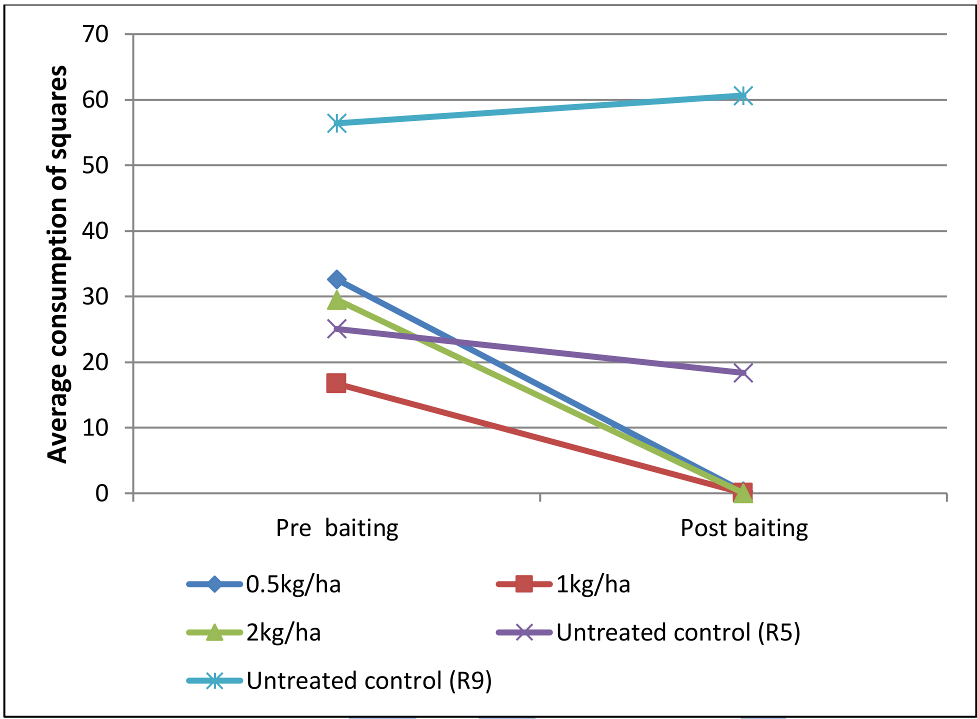


***Figure 12*** *Average census card activity showing treatment effect (BACI model).*

### *7.1.4 Index 4. Talc Burrows*

Talc burrow results were consistent with the population estimates. Results show a clear decline in mouse burrow activity post baiting in treatment grids (see Figure 13). The 1kg/ha treatment was the most effective (efficacy of 85%), whilst the 0.5kg/ha treatment was the least effective at 73% (see Table 5). Due to the small sample size, the difference between pre and post baiting number were statistically insignificant between treatments.

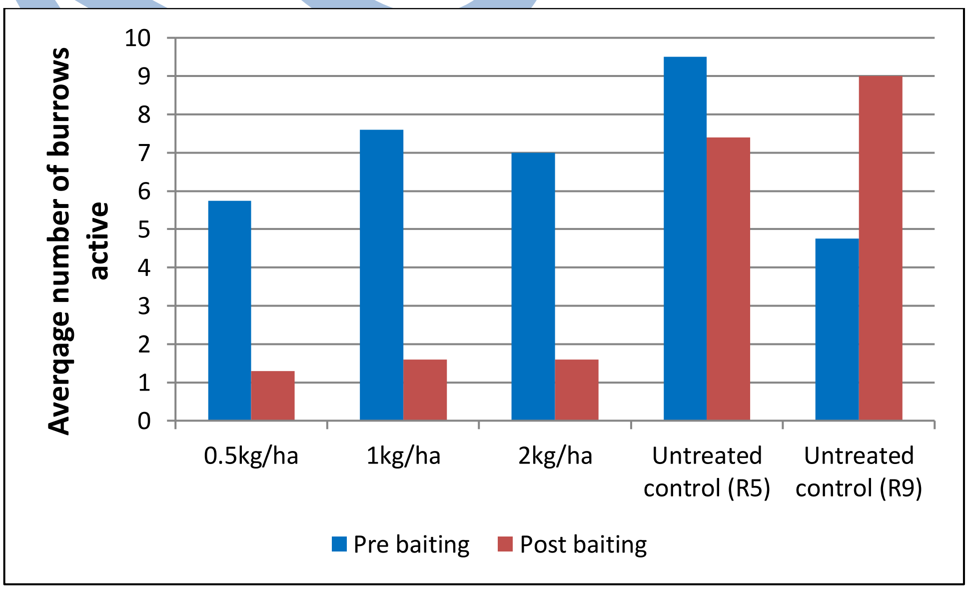


***Figure 13*** *Mean number of active talc burrows before and after baiting with MOUSEOFF® Zinc Phosphide Bait.*

***Table 6*** *Talc burrow activity index. Efficacy corrected for control based on the mean number of talc burrows active pre and post baiting*

| | Average activity Pre baiting | Average activity Post baiting | % Efficacy |
|---|---|---|---|
| **0.5kg/ha** | 5.75 | 1.33 | 73% |
| **1kg/ha** | 7.25 | 1.67 | 85% |
| **2kg/ha** | 7 | 1.67 | 82% |
| **Untreated control (R5)** | 9.5 | 7.4 | - |
| **Untreated control (R9)** | 4.75 | 9 | - |

Average burrow activity in the R5 untreated control area declined post baiting by 22%, whereas the treatment grids declined by 77% (0.5kg/ha), 79% (1kg/ha) and 77% (2kg/ha). In contrast the untreated control grid (R9) increased in activity by 89%. The treatment effect as depicted by the BACI model is in Figure 14.

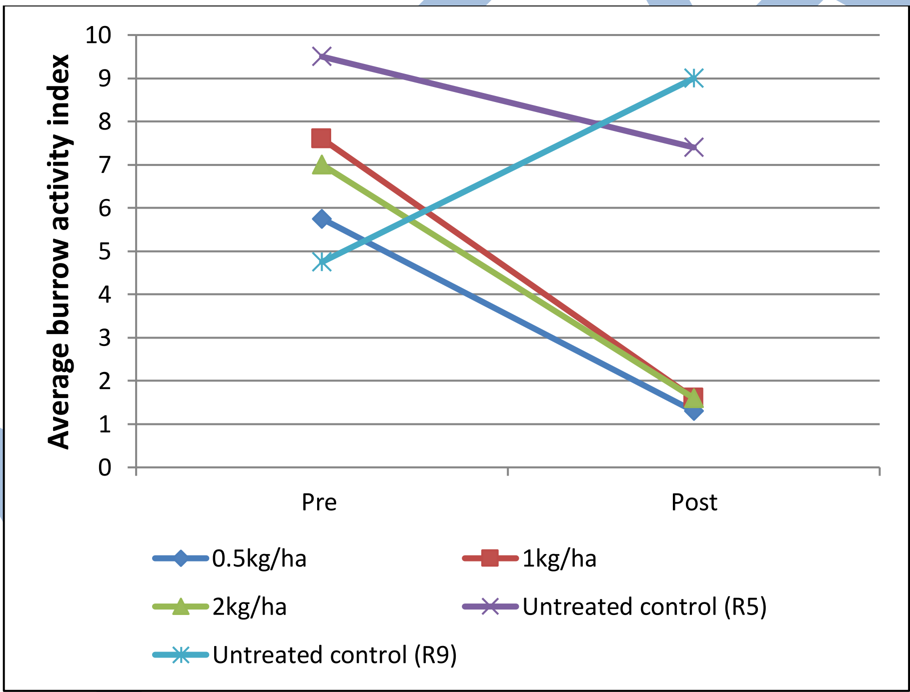


***Figure 14*** *Average talc burrow activity index showing treatment effect (BACI model).*

### 7.1.5 *Index 5. Spotlight surveys*

The number of mice recorded during spotlight surveys indicated a decrease in mouse activity within treated grids during the post-bait trapping period (see Figure 15). The largest decrease was seen in the 2kg/ha monitoring grid, with an average of 10 mice observed during the pre-bait spotlight surveys and none during the post-bait surveys. More mice appear to be active on the untreated control grids during the post-baiting period than during the pre-baiting surveys. The untreated control (R5) area saw a 206% increase in activity, whilst the R9 area recorded a 200% increase in activity

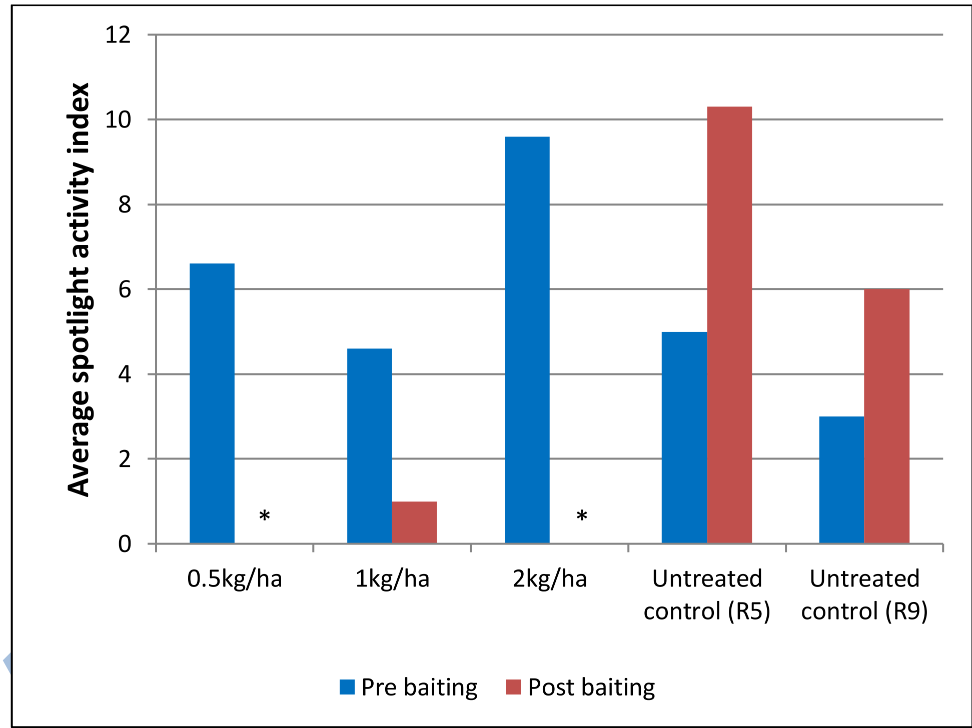


***Figure 15** Mean number of mice seen during spotlight surveys conducted pre and post baiting (n=3). (* = no mice seen)*

***Table 7** Spotlight survey activity index. Average number of mice seen pre and post baiting.*

| | Pre-baiting | Post-baiting | % Efficacy |
|---|---|---|---|
| **0.5kg/ha** | 6.6 | 0 | 100 |
| **1kg/ha** | 4.6 | 1 | 89.33 |
| **2kg/ha** | 9.6 | 0 | 100 |
| **Untreated control (R5)** | 5 | 10.3 | N/A |
| **Untreated control (R9)** | 3 | 6 | N/A |

The BACI model in Figure 16 shows a clear treatment effect. Both non-treatment control areas (R5 and R9) increased in activity whilst all treatment grids recorded a decrease in activity.

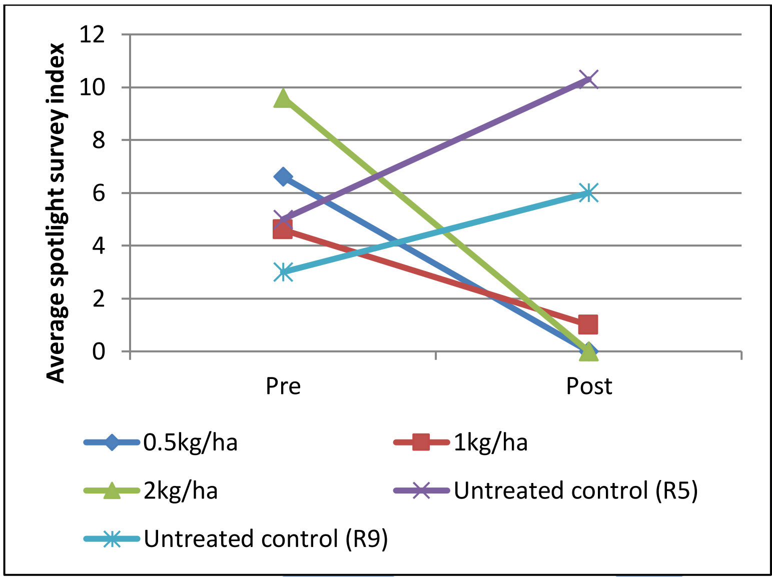


***Figure 16** Average spotlight survey activity index (BACI model).*

### *7.1.6 Summary of efficacy*

Each efficacy index varied slightly from the other efficacy indices. All, with the exception of trapping success at 0.5kg/ha (46.3%), showed greater than the required 70% efficacy. This may indicate trapping as an index is prone to bias as mice are far more attracted to traps than other indices. Within the 0.5kg/ha treatment the population of mice decreased by an estimated 81% (Jolley-Seber population model). The population estimated accounts the number of individuals caught both pre and post baiting and their respective trapping histories where as a simple trap success index considers only the number of actual captures per day, which is why it may be a more reliable indicator of effects on a local population. New mice trapped may be re-invaders and not previously untrapped residents that survived baiting.

***Table 8** Summary of efficacy data for all activity indices measured.*

| | Percentage Efficacy | | | | | |
|---|---|---|---|---|---|---|
| | **Trapping success** | **Population estimation** | **Talc burrows** | **Census cards** | **Spotlight transects** | **Average** |
| **0.5kg/ha** | 46.3 | 81.6 | 73 | 99.2 | 100.0 | 79.4 |
| **1kg/ha** | 81.6 | 94.0 | 85 | 99.8 | 89.3 | 89.9 |
| **2kg/ha** | 70.7 | 91.3 | 82 | 99.9 | 100.0 | 88.7 |

Interestingly the 1kg/ha grid consistently did as well, or outperformed, the 2kg/ha grid in efficacy values despite it receiving only half as much bait with 18% fewer mice based on density estimates.

## 7.2 Observations on population structure and dynamics

### *7.2.1 Survivorship*

Only two mice captured during pre-baiting within treated areas were recaptured post baiting (one each in the 0.5 and 1kg/ha grids). The recapture of mice during the post baiting period compared to pre baiting in untreated control sites was high in R5 – 61.1%, and moderate in R9 – 50.4%.

***Table 9*** *Tagged survivors recaptured post baiting*

| Treatment (kg MOZP / ha) | No. individuals tagged pre baiting | No. individual mice caught post baiting | No. of individual mice surviving baiting | % Survivorship |
|---|---|---|---|---|
| **0.5kg/ha** | 103 | 53 | 1 | 0.97% |
| **1kg/ha** | 103 | 25 | 1 | 0.97% |
| **2kg/ha** | 124 | 44 | 0 | 0.00% |
| **Untreated control (R5)** | 136 | 138 | 83 | 61.02% |
| **Untreated control (R9)** | 79 | 125 | 63 | 79.74% |

Survival probability equals the probability of survival from sample time *t* to sample time *t* + 1. Due to the method of calculation, the probability of survival is not possible for the last two time periods measured. Calculated survival probabilities for the untreated controls remained high (77%-102%) over the entire time measured.

Survival probabilities generated by the Jolley-Seber population model show a decrease in survival probabilities going into the baiting period for all treated grids. The probability of survival from one period to the next decreased from ~100% on day -3 to 0-2% on the final day of trapping prior to baiting. Mice caught in 1 and 2kg/ha treated grids post baiting had a low to moderate probability of survival ranging from: 14% to 25% for the first two days of assessment riding to 75% on the final day of assessment.

Within the 0.5kg/ha grid probability of survival was higher at 58% rising to 98% by the final day of assessment.

Limitations of the Jolley –Seber model result in survival probabilities not being able to be calculated for the last two trapping periods. This is reflected in the decrease in survival probabilities in the last two trapping periods in the treated areas prior to baiting. The population's in these two sites is effectively removed thus the two periods prior to this have dramatically decreasing rates.

The low to moderate survival probabilities in the 1kg/ha and 2kg/ha grids post baiting suggests residual bait may still be present and acting on mice.

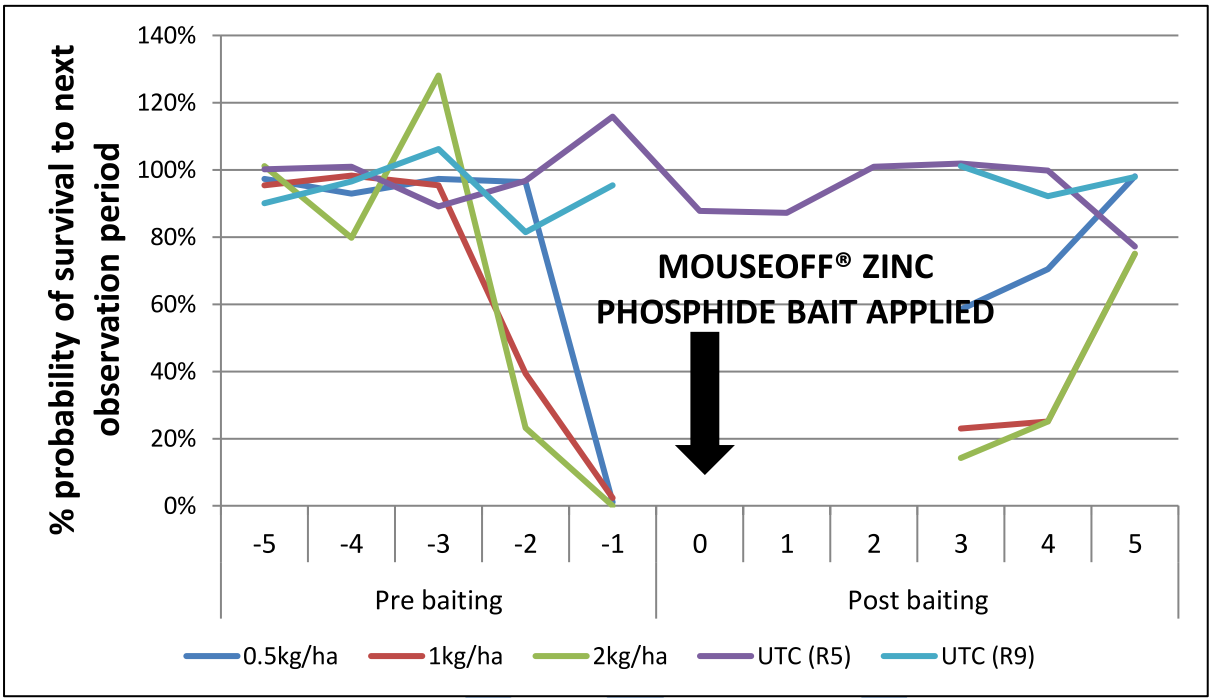


***Figure 17*** *Probability of mice surviving from one period to the next, during the pre & post baiting periods. Probabilities >100% indicate new mice are entering the grid, increasing the trappable population.*

### *7.2.2 Recapture of individuals*

Knowing how long to trap for in any one study is important for determining the accuracy of population estimates, it can be inferred using re-capture rates. When trapping in "closed" population studies (of which this was not) a recapture rate of around 70% is considered acceptable for calculating population estimates. As this was an open population model in the middle of a mouse plague a more appropriate benchmark might be when recapture rates plateau over trapping time.

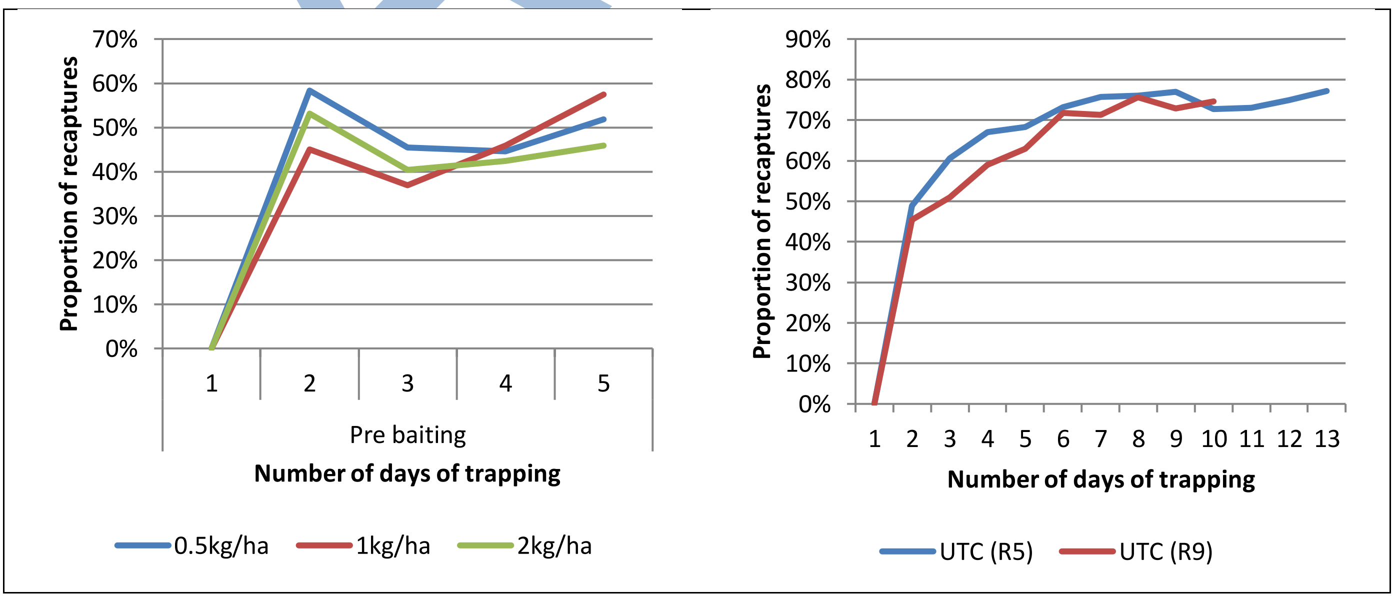


***Figure 18*** *Recapture of individuals over time*

Recapture rates were a little ambiguous within the treated areas for the first 5 days of trapping. However the rate at which mice were recaptured did appear to be slowing down. Within the untreated control grids recapture rates started to plateau between 5-6 days of trapping, further supporting the justification of trapping for a minimum of 5 days to gain reliable field population data.

***Table 10*** *Recapture rates for individually tagged mice*

| Treatment (kg MOZP / ha) | PRE BAIT | | POST BAIT | | Entire Study |
|---|---|---|---|---|---|
| | Individuals tagged | % recaptured | Individuals tagged | % recaptured | |
| **0.5kg/ha** | 102 | 51.8% | 52 | 51.4% | 45.3% |
| **1kg/ha** | 103 | 57.4% | 25 | 19.0% | 46.8% |
| **2kg/ha** | 122 | 45.9% | 43 | 50.0% | 42.1% |
| **Untreated (R5)** | 135 | 68.3% | 136 | 77.2% | 77.2% |
| **Untreated (R9)** | 106 | 62.9% | 105 | 74.6% | 74.6% |

Recapture rates of mice were moderate at all sites prior to baiting (45.9% - 68.3%). The highest recapture rates were reached in the untreated control grids (71.3%-77.2%). Recapture rates reached a plateau in these grids after 5 days of trapping and varied between 71-77% for the remainder of the trial.

The untreated control (R5) increased steadily over each day and stabilised around 4 days of trapping (trial day -2). This grid had been previously established in Trial 1 with 7 trapping days before commencement of this trial. R5 reached 70% recapture on day 0 (after 6 days of trapping) and after this averaged around 75.0% recapture rate. The number of mice entering the population of known individuals and being re-caught at least once stabilised quickly within this grid. R9 also stabilised after 6 days of trapping (trial day 3) at an average of 73.2%.

A higher recapture rate within the treated grids may have been possible if trapping were undertaken for a longer period prior to baiting. However, this seemingly moderate recapture rate on the treated grids over time (excluding the effects of baiting) would seem indicative of high densities of mice, leading to trap saturation and high trap competition. Furthermore, there could have been a breakdown in site specific attachment with mice moving on and off the trapping grid. Any post baiting interpretation as to the cause of low recapture rates is confounded by the presence of bait and the ongoing mortality of mice due to bait consumption.

In further support of the presence of high densities (over the pre baiting period – 5 days trapping), only 50 traps per monitoring grid were set and on each of the monitoring grids the number of individual mice caught and tagged was between 102-135. This is around 2 - 2.7 times the number of traps present and available to catch mice. As the number of mice was so high in relation to the number of traps present, competition for traps was naturally high, leading to lower than desirable recapture rates. The addition of more traps to each monitoring grid to reduce trap competition and increase the recapture rate and improve population estimates was not possible due to limited number of traps available for the study.



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### 7.2.3 Marked to unmarked capture ratio

The ratio of marked to unmarked animals in each capture period is an indicator of population size and is the basis of the Schnabel population estimated for closed populations. This model was deemed inappropriate because assumptions of closure could not be made. An examination of the way the proportion changes overtime within individual trapping grids shows in part why this model was inappropriate.

Within the treated areas the proportion of marked animals reached between 59.2%-72.9% by the 5th day of trapping. This moderate proportion is an indicator of the high density of mice in the area and high completion for traps. It may also be an indication that a proportion of mice are not attached to grids (particularly within the 2kg/ha grid) and new mice are continually entering the grid whereas most previously trapped mice are exiting.

The Untreated control grid (R5) was previously established in trial 1 which is why 50% of the mice caught on the first day of trapping were already tagged. This site quickly reached a plateau after the second day of trapping where daily recapture proportions were 73.1% -96.3% (average 81.9%).

***Table 11** The percentage of marked mice in daily captures*

| | Day | 0.5kg/ha % | 1kg/ha % | 2kg/ha % | UTC (R5) % | UTC (R9) % |
|---|---|---|---|---|---|---|
| **Pre Baiting** | -5 | 0.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| | -4 | 24.1 | 25.0 | 40.5 | 81.6 | 24.4 |
| | -3 | 31.6 | 31.7 | 30.4 | 73.1 | 44.9 |
| | -2 | 30.2 | 47.8 | 42.0 | 83.0 | 65.5 |
| | -1 | 59.6 | 72.9 | 59.2 | 84.3 | 79.2 |
| **Post baiting** | 0 | **Bait applied** | | 83.7 | Traps closed | |
| | 1 | Traps closed | | 81.5 | | |
| | 2 | | | 80.0 | | |
| | 3 | 4.0 | 7.1 | 0.0 | 72.4 | 81.8 |
| | 4 | 42.1 | 33.3 | 25.0 | 81.5 | 90.0 |
| | 5 | 59.1 | 75.0 | 25.0 | 81.0 | 88.2 |
| | 6 | 75.0 | 37.5 | 36.4 | 83.9 | 81.2 |
| | 7 | 42.9 | 50.0 | 31.6 | 96.3 | 90.2 |

The untreated control grid R9 also reached a plateau for the proportion of recaptures by day 5 of trapping and varied between 79.3 % and 90.2% for the remainder of the trial but averaged 85.2%.

Interestingly treated areas did not achieve very high recapture proportions post baiting with a lower population in these areas, despite there being between 1.8-8.3 times as many traps as estimated mice within the study grids. The failure to continually recapture mice may be due to ongoing mortality, mice still finding and consuming residual MOUSEOFF® Zinc Phosphide Bait or mice moving off the grid shortly after moving onto it (which in itself may be an artefact of the massive social disruption caused by baiting).

The actual percentage of individuals recaptured was consistently lower than the proportion of recaptures made. The difference indicates a number of individuals appeared to remain on the grids for the entire trapping period and were consistently caught. Of those individuals caught 3 or more times, 49.6% were reproductively active males or females. When considering only those mice caught once or twice, the proportion of active adults is only 25.0% (Chi-square analysis was indicated this as a statistically significant difference, $p < 0.001$).

Reproductively active adults appeared to be more site attached than either non reproductively active adults or juvenile mice. When the entire data set is considered as a whole, 32.8% of the captured populations were reproductively active adults, which indicates more than half the population was not reproductively active and potentially up to half of these were not site attached. It could be reasonably assumed those mice captured more often were site attached, large adults and that there were potentially a high proportion of non active adults or juveniles that were untrappable due to high competition for traps. This potential for a sizeable proportion of the population to be nomadic or non-site attached is further justification for the use of an open population model.

### *7.2.4 Capture cohorts*

Mice caught multiple times may have been site attached however, this attachment may have been caused by the resources (food and shelter) provided by traps in which case it is a temporary site attachment in response to trapping. Capture cohort analysis may indicate whether or not this is occurring, particularly within the untreated control sites where traps are closed during baiting and thus the mice, if only attracted to traps, may move on seeking food and shelter elsewhere.

Animals first captured in each session (5 days trapping pre and post) were designated as belonging to that cohort. The number of animals surviving for recapture from one cohort to the next was examined. There were two surviving animals recaptured post baiting in the treatment areas (section 7.2.1.). Post baiting within the untreated controls found the majority of mice caught were from the first cohort (61% in R5 and 68% in R9)

Over time this trend for a changing of individuals present on a grid (regardless of baiting) was more clearly seen in larger data sets (Figure 20). The closure of traps between trapping periods may have removed the incentive for mice to stay on the monitoring grid.

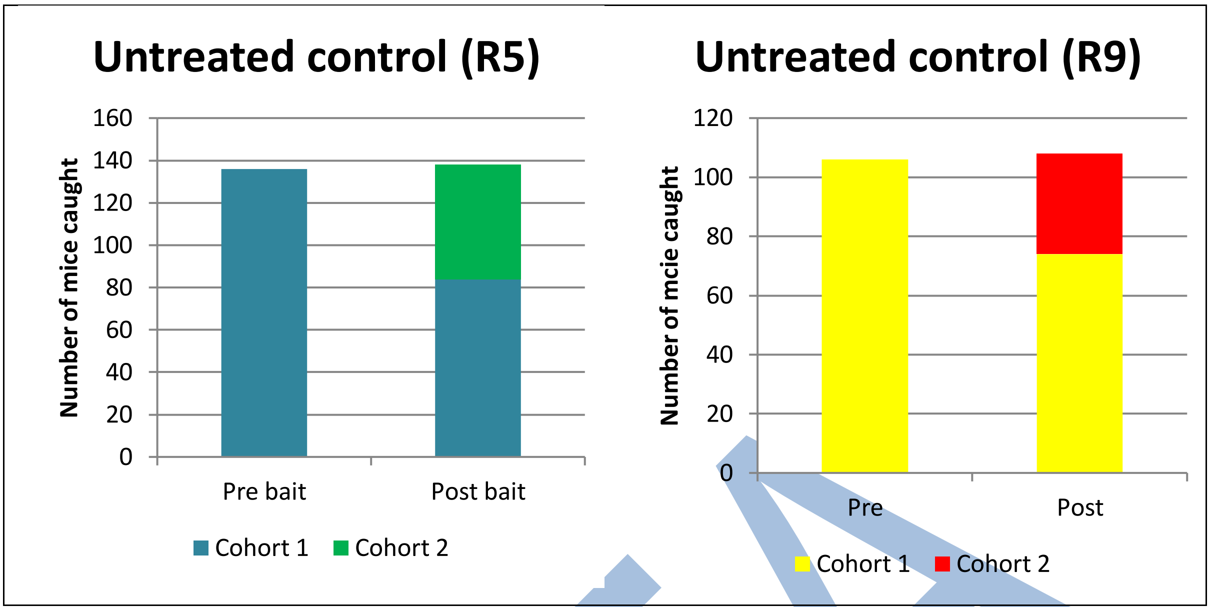


***Figure 19*** *Capture cohorts pre and post baiting on the two untreated control grids. Each colour represents a different cohort of mice showing when they were first caught.*

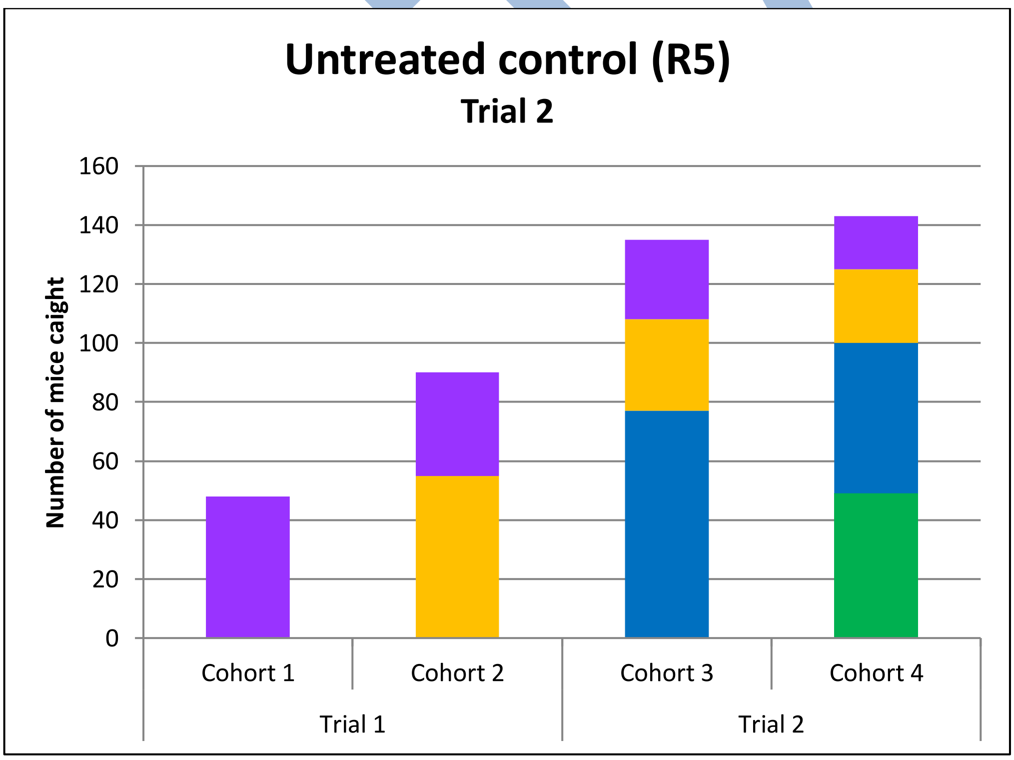


***Figure 20*** *Cohort analysis of UTC (R5) including data from trial 1. Cohorts 1 and 3 were captured during pre-baiting phases and cohorts 2 and 4 during post baiting.*

Cohort analysis suggests individuals are moving on and off the monitoring grid over time and either lack site attachment or competition for traps and/or resources in any one area is so strong individuals are constantly being pushed out by the pressure of incoming individuals. This would create an effect whereby mice are constantly moving through the environment searching for resources. The presence of food in traps may attract and hold mice in an area for a short period but it would appear the majority of mice are constantly moving.

### *7.2.5 Population structure*

Across the entire study the ratio of females to males was almost even, 49.3% male: 50.7% female. During the post baiting phase there was a slight increase in the proportion of males 47.7% to 54.0%.

Adult mice made up the majority of mice captured across the entire trial (86.7% pre and 84.6% post) resulting in the juvenile proportion being quite small across and increasing only slightly post baiting.

***Table 12*** *Population structure for pre and post baiting showing adults to juvenile mice*

| Population structure | Pre baiting | Post baiting |
|---|---|---|
| **Female Adult** | 45.3% | 40.3% |
| **Female Juvenile** | 7.0% | 5.7% |
| **Male Adult** | 41.4% | 44.3% |
| **Male Juvenile** | 6.3% | 9.7% |
| **Total** | 100.0% | 100.0% |

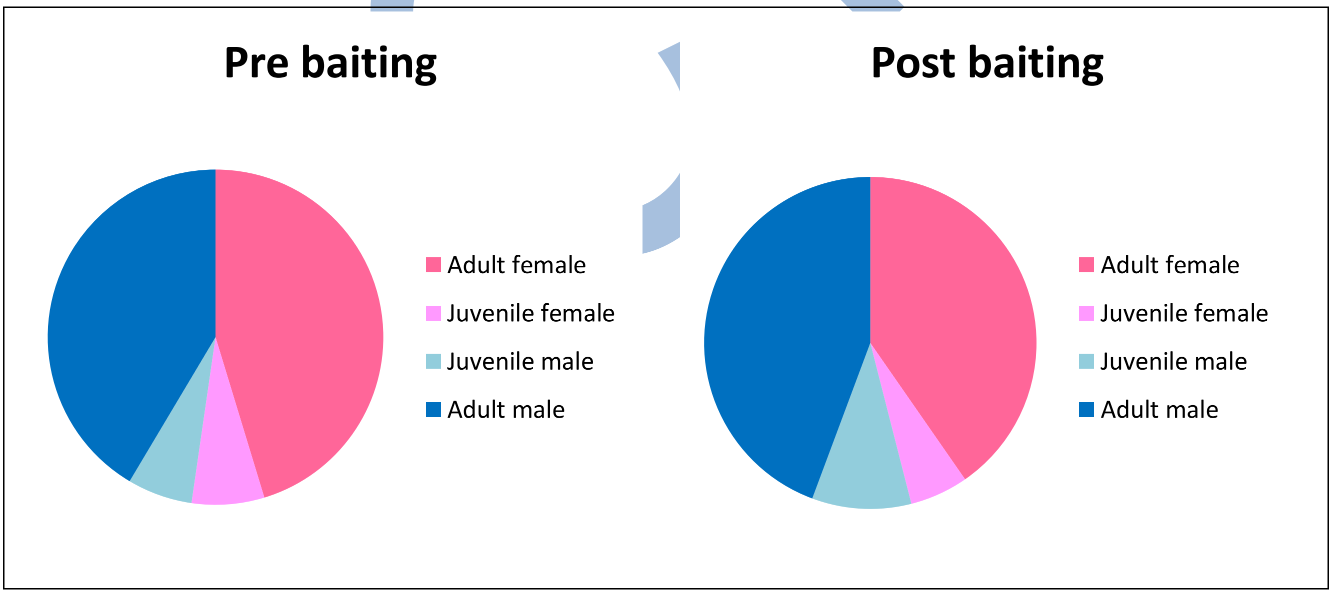


***Figure 21*** *Population structure breakdown pre and post baiting showing adults : juveniles*

There was a decline in the number of reproductively active females detected post baiting. All other groups increased slightly.

***Table 13*** *Population structure pre and post baiting showing reproductive activity of adults*

| Population Structure | Pre baiting | Post baiting |
|---|---|---|
| Female active | 23.9% | 16.8% |
| Female not active | 28.3% | 30.9% |
| Male active | 11.7% | 14.8% |
| Male not active | 36.1% | 37.5% |
| Total | 100.0% | 100.0% |

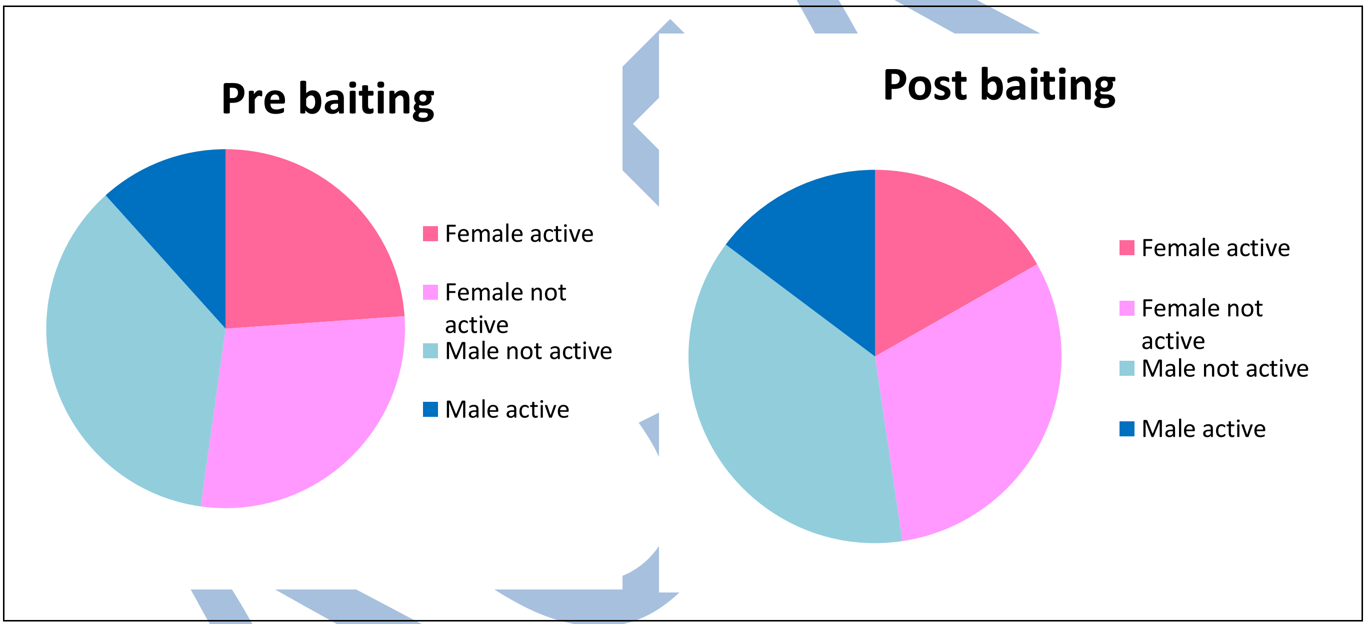


***Figure 22*** *Population structure pre and post baiting showing reproductively active to non-active.*

## 7.3 Mouse movement

### *7.3.1 Movement within the intensive monitoring grid*

Across the entire trial the number of mice caught multiple times on a grid was relatively similar within the treated grids (range 57-61) and again within the untreated control grids (range 101-138). The 2kg/ha grid had the highest estimated density and also the lowest observed movements between multiple traps.

***Table 14*** *Summary data of mice moving between traps within each monitoring grid over entire study*

| Treatment MOZP / ha | Estimated density Mice /ha | No. Individuals tagged on grid | No. Individuals caught >1 | Individuals caught at different traps | Sedentary mice % | Mice movement b/w traps % |
|---|---|---|---|---|---|---|
| **0.5 kg** | 451 | 153 | 61 | 27 | 55.7 | 44.3 |
| **1 kg** | 454 | 127 | 57 | 21 | 63.2 | 36.8 |
| **2 kg** | 558 | 165 | 57 | 15 | 73.7 | 26.3 |
| **Untreated R5** | 549 | 187 | 138 | 57 | 58.7 | 41.3 |
| **Untreated R9** | 436 | 137 | 101 | 32 | 68.3 | 31.7 |

Within the treated grids both the proportion of mice moving between multiple traps and the average distance moved by mice increased post baiting (statistical analysis was not possible due to the lower numbers of individuals caught on multiple occasions post baiting). This purposed decline in sample sizes for post baiting periods is one of the limitations of efficacy studies. However, movement on the treated grids increase by 55% on the 0.5kg/ha grid, 100% on the 1kg/ha grid and 39% on the 2kg/ha grid.

***Table 15****. Mouse movement and how it changed between pre and post baiting periods*

| Treatment MOZP / ha | Pre baiting | | | POST BAITING | | |
|---|---|---|---|---|---|---|
| | No. Captured multiple times | % that moved between traps | Average distance travelled (m) | No. Captured multiple times | % that moved between traps | Average distance travelled (m) |
| **0.5kg** | 41 | 36.5 | 14.2 | 20 | 60.0 | 22.1 |
| **1kg** | 52 | 32.7 | 18.3 | 5 | 80.0 | 36.78 |
| **2kg*** | 48 | 18.7 | 11.6 | 9 | 66.6 | 16.1 |
| **Untreated R5** | 105 | 35.2 | 21.9 | 118 | 39.8 | 19.6 |
| **Untreated R9** | 86 | 53.5 | 22.3 | 90 | 74.4 | 21.9 |

Mouse movement within the untreated control grids did not alter much between pre and post baiting. There was a slight decrease in both the proportion and distance moved post baiting for both grids but these changes were very slight, (decrease in average movement on R5 by



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2.3m and a decrease of 0.4m on R9.) However, the proportion of mice detected moving between multiple traps increased post baiting. It would appear a few mice made longer distance trips between traps during pre baiting whereas post baiting more mice moved shorter distances. One possible explanation is over the period monitored, mice moved onto the grids (attracted to traps) and stayed on the grids to access the resources of the traps. Mice arriving onto the grid would explore the area with some setting up temporary site attachment. As more mice entered the ability to explore would be hampered by the presence of conspecifics. Exploratory behaviour would be curtailed and a decrease in average movement would be observed.

The increase in both the proportion of mice moving and the average distance moved on treated grids is one indication of massive social disruption. Mice are able to move more freely when there are fewer conspecifics to avoid.

### *7.3.2 Movement between monitoring grids*

Three mice were detected as having moved between monitoring grids.

***Table 16*** *Individual mouse movements between monitoring grids.*

| Tag # | Location originally caught | Subsequently caught | # of days between captures | Distance travelled (m) | Travel per night (m) | Comments |
|---|---|---|---|---|---|---|
| 437 | UTC (R4) | UTC (R5) | 18 | 7900 | 438.9 | Originally detected trial 1 UTC (4); last seen during pre baiting. Found first day post baiting trial 2. |
| 613 | 2kg/ha (trial 1) | UTC (R5) | 13 | 7250 | 557.7 | Originally detected trial 1 2kg/ha grid; last caught there during pre baiting. Found pre baiting period in trial 2 |
| 1533 | 2kg/ha | UTC (R5) | 8 | 1660 | 207.5 | First detected during pre baiting, then again post baiting. |

Two of these mice (tag #437 and #613) were detected as having moved from the paddock in trial 1 over 7km away. The other mouse was detected as having moved between sites UTC (R5) and UTC (R9) both located within the one paddock.

This movement between grids is one of the problematic factors meaning samples are not strictly independent. This limits the application and power of statistical analysis which can be applied to the data. It is also the reason to select for open population rather than closed population models. Previous research on mouse plagues in the Ayre Peninsular in 2010 also found movement of mice over distances such as these reported here (see Report MO2010 004/B) and a small scale radio tracking trial was undertaken to further investigate this phenomenon (see Report MO2010 004/A).

Movement detected here further substantiates the phenomenon of mice moving great distances during plague as the population largely becomes transient rather than sedentary and site attached.

## 7.4 Bait uptake

Overall bait uptake from the Bait Uptake Grids (Methods Section 6.4) at 9 days post baiting was 70%, 65% and 85% for the 0.5, 1 and 2kg/ha grids respectively. All grids showed a slightly different bait uptake pattern over time. The 0.5kg/ha grid had a huge initial uptake, followed by no uptake on days 5 and 6, then very little bait uptake throughout the remainder of the monitoring period. Whereas the 2kg/ha grid had little uptake until day 5 where it increased dramatically for 2 days, followed by little uptake for the remainder of the monitoring period. The 1 kg/ha grid showed an initial moderate uptake which steadily increased throughout the monitoring period, before reaching a plateau after day 7 with no further uptake.

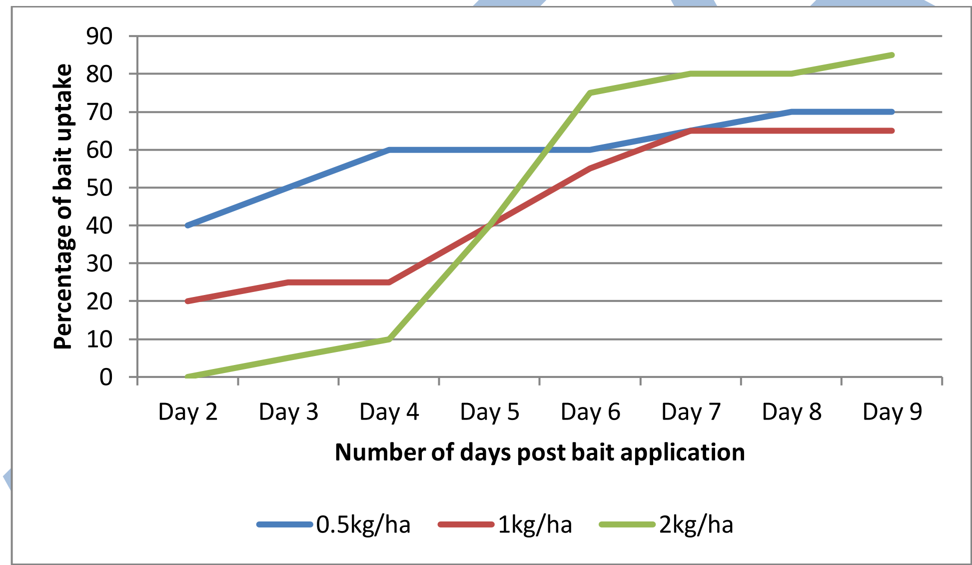


***Figure 23*** *Cumulative percentage of bait uptake over time. Bait uptake grids set one day after bait application*

## 7.5 Non-target observations

On two occasions fox activity was recorded at two different bait uptake grids within the 0.5kg/ha treatment area on day 3 and day 9 post baiting.

A fox den was found within the 0.5kg/ha treatment grid which appeared to be active. Foxes were also heard within the area whilst the mouse spotlight survey was undertaken in the untreated control grid in R9 prior to baiting.

Whilst moving between monitoring grids for spotlight surveys, stubble quail were flushed and owls were heard to be active within all treatments during both the pre and post baiting periods. Thirteen quail were observed during pre-baiting surveys, whilst 12 were recorded during the post baiting period. These numbers are approximate, so appreciable impact of baiting on these non-target species can be inferred.

No other non-target impacts were observed or reported by the farmer or the farm workers.

## 7.6 Post trial follow up

Prior to trials commencing, snap traps were placed in lines of ten (spaced 10m apart) to gain a rough estimate of mouse activity in paddock so the most active paddocks could be selected for trial work. Once the trial was completed, trial grids were revisited and a follow up assessment conducted using snap traps. A 4 x 4 grid with 10m spacing's, was set up. Each grid was in place and monitored for a single night. Trapping lines used prior to the trial to assess the suitability of each paddock for trials were repeated in roughly the same location post trial at 23 days.

Snap traps recorded reasonable numbers of mice prior to the trial commencing except in the area which became the 1kg/ha grid. In this grid, 2 traps were lost and a number of others had been moved from the spot where they had been originally placed. All recovered snap traps had been set off and thus were recorded as a trap fail. It was suspected that fox activity in the area was responsible for the failure of this site to yield snapped mice. However, the other areas trapped revealed an adequate mouse population confirming this paddock was suitable for efficacy trials.

***Table 17*** *Pre and post trial snap trap results*

| TREATMENT GRID | PRE/POST TRIAL | NO. DAYS POST TRIAL | TRAP SUCCESS | TRAP CONFIGURATION |
|---|---|---|---|---|
| 2kg/ha | Pre | - | 33.3% | Line x 2 |
| 2kg/ha | Post | 5 | 7.14% | Grid |
| 2kg/ha | Post | 8 | 0.0% | Grid |
| 2kg/ha | Post | 23 | 0.0% | Line x 1 |
| 1kg/ha | Pre | - | 0.0% | Line x 1 |
| 1kg/ha | Post | 5 | 0.0% | Grid |
| 1kg/ha | Post | 8 | 22.2% | Grid |
| 1kg/ha | Post | 23 | 33.3% | Line x 1 |
| 0.5kg/ha | Pre | - | 93.3% | Line x 1 |
| 0.5kg/ha | Post | 23 | 0.0% | Line x 1 |

*Further details of trap results including malfunctions and trap fails can be found in Appendix 10.9.*

The live capture data post baiting showed an increase in mouse activity towards the end of the post bait monitoring period. Further monitoring was therefore desirable after trial completion to indicate if mice were reinvading the paddock or if mice caught on the monitoring grids represented a hot spot of activity. Thus snap grids were not placed in the intensive monitoring grid but randomly placed within the treatment grid at large to gain a better idea of mouse activity within the paddock.

Within the 2kg/ha grid post trial snap traps detected mice 5 days post trial at low levels but no other mice were detected after this. While the 1kg/ha grid recorded no mice at 5 days, it did at 8 days, with a further increase at 23 days. The snap line on the last monitoring period was located near an active mouse hole and there were signs sown seed in the vicinity had been



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dug up and consumed. A limitation of snap traps available meant the 0.5kg/ha grid could only be monitored on day 23 post trial. No captures were made at that time.

Prior to trial work commencing, mice appeared to be relatively widespread, though after the trial only 'hotspots' of activity remained. It is unknown whether mice caught post baiting in live capture traps continued to survive in the paddock, moved on in search of food or eventually found some residual MOUSEOFF® Zinc Phosphide Bait and died. However it was observed during one of the snap trap baiting periods the neighbouring farmer to the east (bordering 1kg/ha and 0.5kg/ha areas) baited his paddock with MOUSEOFF® Zinc Phosphide Bait.

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# 8 Summary and Recommendations

Results show MOUSEOFF® Zinc Phosphide Bait applied at 1 and 2kg/ha was highly effective at decreasing mouse activity to up to 5 days post baiting. Lower efficacy was demonstrated with the 0.5kg/ha treatment, though not all indices were in agreement: low efficacy was recorded using the trapping success indices. It may be that mice are attracted to the free feed in traps, thus there is greater potential for mice to interact with these measures than other indices. If mice are indeed attracted to the free feed in traps, which increases the trap success rate relative to the rest of the grid, then it might be possible to utilise this behaviour as a way of attracting mice into an area then baiting it intensively. However, the area over which this “attracting” influence occurs would first need to be established as does the influence of attraction in relation to alternative food availability and mouse density.

There appeared to be little advantage to baiting at the higher rate of 2kg/ha compared to the current practice of 1kg/ha: there was little difference between the two treatments. However, it should be noted the 1kg/ha grid had bait applied on two of its borders giving potential from only two directions for reinvasion. Whereas the other two treatments had three boarders unbaited and thus three directions from which mice could have reinvaded (See Figure 24). Regardless, there is no evidence baiting at a higher rate has a longer lasting suppressive effect of mouse activity for up to 1 week post baiting nor does baiting at a lower rate perform as well as the 1kg/ha rate. Post bait follow up using snap traps demonstrated mice were in lower numbers than that observed prior to baiting.

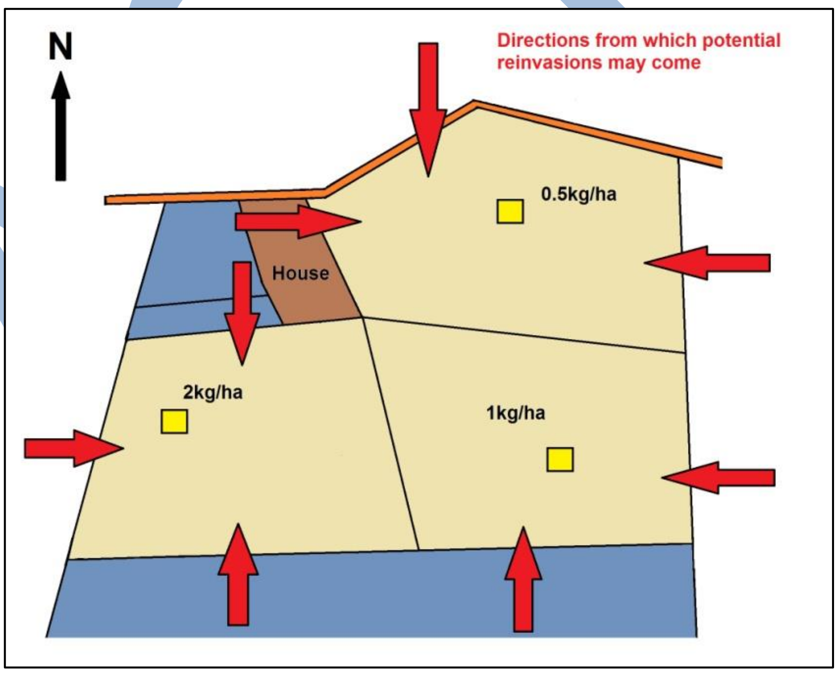


***Figure 24*** *Baited areas showing potential directions from which mice could reinvade.*

**Baiting at higher levels during plague is therefore not recommended.** Follow up baiting may be required in hot spots but snap trap sampling may be required to identify those areas, alternately farmers can inspect fields and where active mouse holes are observed with seed loss in the immediate vicinity, follow up baiting of those areas may be warranted. Where many holes appear active or the distribution of active holes appears to be even across the sown area, a reapplication of 1kg/ha MOUSEOFF® Zinc Phosphide Bait may be warranted.

Despite the evidence mouse activity decreases following baiting with MOUSEOFF® Zinc Phosphide Bait, the ultimate economic value of impact of baiting cannot be determined without longer term studies that incorporate some measure of crop loss and careful monitoring of crop invasion from adjacent areas.

Mice caught on grids post baiting may have been either:

1. Mice resident at the time of baiting but not detected prior to baiting.
2. Mice reinvading the paddock from adjacent unbaited areas.

If mice were resident at the time of baiting, were they resident in the monitoring grid or just in the field at large? Why did these mice not succumb to baiting? Did they encounter bait and fail to consume it, consume a sub lethal dose or fail to encounter any bait at all due to the activity of other mice competing for bait?

Alternately do these previously uncaptured individuals caught post baiting represent mice translocating into this treated paddock from an untreated area? If so, did they fail to encounter residual MOUSEOFF® Zinc Phosphide Bait? This would indicate mice present are consuming more than the required lethal dose. Work is currently underway to address the question of the level of consumption of MOUSEOFF® Zinc Phosphide bait in the field by mice.

However, it is more likely the majority of mice captured post baiting were reinvading individuals due to:

- Low numbers of mice found surviving in treated grids post baiting, but untreated control areas continued to capture previously marked animals during this period,
- Mice were found capable of moving long distances in a single night,
- Trap success rates of mice were low post baiting but continued to rise steadily in treated grids from day 5 post baiting onwards,
- Evidence of increased individual movement based on the social disruption of the sudden removal of many mice from population due to baiting, and
- Increased bait uptake from day 5 post baiting in the 1kg/ha and 2kg/ha grids.

In light of this, re-baiting a week after first baiting in order to quell any re-infiltration onto previously baited grids will provide a further suppressive effect on mouse activity, and may be a preferred course of action to affect better long term control. This is particularly important if adjacent paddocks have not been baited with MOUSEOFF® Zinc Phosphide Bait, as mice may be translocating from these uncontrolled populations. This is of particular interest now mouse movements during plague have been found to be considerably greater in short periods of time than previously thought, (See MO2011/006A and MO2011/006B).

This study identified the importance of extending trapping days to at least 5 days to gain a reasonable population estimate, and longer periods of monitoring post baiting to determine rates of reinvasion. Previous studies (Brown et al., 2002, Mutze and Sinclair, 2004) have trapped for 3 days pre and post baiting only and reported population estimate and efficacy values.  However, this trial has highlighted several problems with short trapping times when mice are at high densities.

1) Estimates are less accurate with less data, and only certain (weaker) statistical tests can be used (eg. Petersen estimates).  In contrast, Jolly-Seber is a stronger method to estimate density but requires more trapping days for greater precision, and
2) An end user picture cannot be gleaned when only trapping for 3 days.  Efficacy values tend to be higher in studies that only trap for 3 days as mice re-invading the unoccupied grid largely remain undetected during that period.  Efficacy values derived from such studies are legitimate and correct and prove fast knockdown value.  However, the farmer with problems of reinvasion will only perceive results over a longer time scale.  In this case it will appear the baiting regime failed to control mice in crop, when in fact the problem lies in the potential for baited areas to be reinvaded during wide spread plague conditions.

When mouse densities are high over a widespread area (plague), farmers might be under the misconception their single application should be enough to suppress mice numbers.  Under these 'plague' conditions farmers should be monitoring and where necessary and baiting again a week later to control mice migrating into the baited area.  This study only just began to pick up the re-invasion of mice, and it utilised 5 days of trapping (ending at 7 days post baiting).  Had post bait monitoring continued, it may have eventually detected trap saturation – indicating large scale mouse movement into the area.  Furthermore a wide spread sampling of treated areas (sub sampling) would give a better indication of control over the entire treatment area and start to give a better indication of the potential attraction of mice into intensive monitoring grids containing live capture traps baited with free feed.  Unfortunately, most trapping studies such as these are severely limited by the number of traps and labour available.

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# 10 Appendices

## 10.1 Trial details.

### *10.1.1 Time line*

***Table 18*** *Time line of trial events.*

| Julian Date | Calendar date | Report date | Activity |
|---|---|---|---|
| 109 | 19/04/2011 | -6 | Traps set |
| 110 | 20/04/2011 | -5 | Day 1 trap results |
| 111 | 21/04/2011 | -4 | Day 2 trap results |
| 112 | 22/04/2011 | -3 | Day 3 trap results |
| 113 | 23/04/2011 | -2 | Day 4 trap results |
| 114 | 24/04/2011 | -1 | Day 5 trap results, Traps closed |
| 115 | 25/04/2011 | 0 | Baited |
| 116 | 26/04/2011 | 1 | |
| 117 | 27/04/2011 | 2 | Open all traps |
| 118 | 28/04/2011 | 3 | Day 1 post bait |
| 119 | 29/04/2011 | 4 | Day 2 post bait |
| 120 | 30/04/2011 | 5 | Day 3 post bait |
| 121 | 1/05/2011 | 6 | Day 4 post bait |
| 122 | 2/05/2011 | 7 | Day 5 post bait |

### *10.1.2 Distances measured between trial grids and site codes*

All field data is recorded using a site code listed below. All results in this document are reported as treatment areas. As treatment areas are not assigned at the beginning of any trial a site code is used instead. Site codes as related to treatment area are as follows.

- Ram 6 – 2kg/ha
- Ram 7 – 1kg/ha
- Ram 8 – 0.5kg/ha
- Ram 9 – Untreated control. (R9)
- Ram 5 – Untreated control (R5)

***Table 19*** *Distance between study grids*

| | Ram6 | Ram7 | Ram8 | Ram9 | Ram5 |
|---|---|---|---|---|---|
| Ram6 | | 1.15km | 763m | 2.42km | 1.66km |
| Ram7 | 1.15km | | 698m | 1.96km | 1.15km |
| Ram8 | 763m | 698m | | 1.7km | 910m |
| Ram9 | 2.42km | 1.96km | 1.7km | | 800m |
| Ram5 | 1.66km | 1.15km | 910km | 800m | |

Site codes are the first three letters of the owners surname followed by a number assigned in order of trial set up. In this case the owner was a Mr. Scott Ramsey (0417987378).

### 10.1.3 Meta data collection summary

| | |
|---|---|
| Data collected by field researchers: | Marion Atyeo and Kerryn Herman of ACTA |
| Data collection over seen by: | Marion Atyeo - ACTA |
| Data entry and analysis performed by: | Marion Atyeo and Marcus Michelangeli of ACTA |
| Write up completed by: | Marion Atyeo - ACTA |
| Contact | Marion Atyeo, Rodent biologist – ACTA<br>Mobile 043035581<br>Office (03) 93089688.<br>Office address: 46-50 Freight Drive Somerton, VIC, 3076 |
| Funding for this work supplied by | Animal Control Technologies (Australia) Pty Ltd |
| Property owner<br>Contact | Mr. Scott Ramsey<br>Mobile 0417 897 378 |
| Location of trial | Bute , SA (Yorke peninsula) |

***Table 20*** *GPS coordinates for trial grids – Degrees decimal*

| Grid | South | East |
|---|---|---|
| Ram 6 | 33° 54’ 32.5” | 138° 00’ 59.6” |
| Ram 7 | 33° 54’ 38.6” | 138° 01’ 43.6” |
| Ram 8 | 33° 54’ 21.3” | 138° 01’ 26.3” |
| Ram 5 | 33° 54’ 00.8” | 138° 01’ 51.5” |
| Ram 9 | 33° 53’ 38.7” | 138° 02’ 07.8” |

All data kept in:
Excel spreadsheet. Hard copies of original data collection kept on file in exercise and note books.

Location of electronic files:
S:\Research & Development\MOUSEOFF\Yorke Peninsula 2011\Efficacy trials\Ramsey trials 1 2 3



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## 10.2 Trap success data

***Table 21*** *Number of trap nights*

| Site / Julian date | Pre baiting | | | | | Post baiting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 110 | 111 | 112 | 113 | 114 | 118 | 119 | 120 | 121 | 122 |
| 0.5kg/ha | 50 | 49.5 | 49.5 | 46.5 | 48 | 49.5 | 48.5 | 48 | 49 | 46.5 |
| 1kg/ha | 49 | 49.5 | 48 | 49 | 47.5 | 25 | 24 | 23.5 | 23 | 23 |
| 2kg/ha | 49 | 48 | 47 | 47.5 | 45.5 | 25 | 25 | 25 | 24.5 | 25 |
| Untreated Control (R5) | 47.5 | 48 | 49.5 | 47 | 49 | 49 | 49 | 49 | 47.5 | 46.5 |
| Untreated Control (R9) | 49 | 46 | 49 | 50 | 50 | 48.5 | 48 | 48.5 | 46 | 46 |

*The 1kg/ha and 2kg/ha grids had a lower number of traps post baiting as traps were required for a study elsewhere. Traps were not experiencing trap saturation during this time and so it was felt that then number of traps available for mice was not limiting the trapping success on the monitoring grid.*

***Table 22*** *Actual number of mice caught*

| Site / Julian date | Pre baiting | | | | | Post baiting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 110 | 111 | 112 | 113 | 114 | 118 | 119 | 120 | 121 | 122 |
| 0.5kg/ha | 13 | 29 | 38 | 43 | 52 | 25 | 19 | 22 | 20 | 28 |
| 1kg/ha | 20 | 36 | 41 | 45 | 49 | 14 | 9 | 4 | 8 | 8 |
| 2kg/ha | 32 | 42 | 46 | 50 | 49 | 18 | 8 | 8 | 11 | 19 |
| Untreated Control (R5) | 46 | 49 | 52 | 47 | 51 | 57 | 54 | 58 | 62 | 54 |
| Untreated Control (R9) | 22 | 41 | 49 | 55 | 52 | 55 | 50 | 51 | 49 | 51 |

***Table 23*** *Trapping success over time*

| Site / Julian date | Pre baiting | | | | | Post baiting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 110 | 111 | 112 | 113 | 114 | 118 | 119 | 120 | 121 | 122 |
| **0.5kg/ha** | 26% | 59% | 77% | 92% | 108% | 46% | 39% | 46% | 41% | 59% |
| **1kg/ha** | 41% | 73% | 85% | 92% | 103% | 53% | 34% | 17% | 27% | 35% |
| **2kg/ha** | 65% | 88% | 98% | 105% | 108% | 61% | 32% | 32% | 41% | 73% |
| **Untreated Control (R9)** | 45% | 89% | 100% | 110% | 104% | 113% | 104% | 105% | 107% | 111% |
| **Untreated Control (R5)** | 97% | 101% | 100% | 99% | 103% | 115% | 110% | 118% | 131% | 115% |

Although widely used by authors catching mice and other small mammals the Caughley trap success correction factor has not been used due to the extremely high trap success and the incidence of multiple capture of mice in traps. This sometimes leads to a greater number of mice caught compared to the overall number of traps available. Once this occurs the correction factor is unable to calculate a correction.

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## 10.3 Population estimation and test for equal catchability

### *10.3.1 Population modelling outputs*

***Table 24*** *Jolly-Seber population model outputs for treated sites*

| 0.5kg/ha grid | Pre baiting | | | | | Post baiting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Dates** | **20-Apr** | **21-Apr** | **22-Apr** | **23-Apr** | **24-Apr** | **28-Apr** | **29-Apr** | **30-Apr** | **1-May** | **2-May** |
| **Proportion marked** | 0.07 | 0.27 | 0.28 | 0.27 | 0.58 | 0.08 | 0.45 | 0.61 | 0.67 | 0.34 |
| **Size of marked population** | 0.00 | 11.67 | 29.44 | 52.00 | 78.00 | 1.00 | 12.25 | 14.25 | 19.86 | |
| **Population estimates** | | 44 | 104 | 191 | 133 | 13 | 27 | 23 | 30 | |
| **Probability of survival** | 0.97 | 0.93 | 0.97 | 0.96 | 0.01 | 0.58 | 0.70 | 0.98 | | |
| **95% confidence Interval for Population size** | | 32.9-83.0 | 70.0-208.8 | 124.1-438.7 | 0 | 0 | 21.6-45.1 | 22.1-28.1 | 23.1-51.7 | |

| 1kg/ha grid | Pre baiting | | | | | Post baiting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Dates** | **20-Apr** | **21-Apr** | **22-Apr** | **23-Apr** | **24-Apr** | **28-Apr** | **29-Apr** | **30-Apr** | **1-May** | **2-May** |
| **Proportion marked** | 0.05 | 0.27 | 0.33 | 0.49 | 0.73 | 0.13 | 0.40 | 0.60 | 0.44 | 0.33 |
| **Size of marked population** | 0.00 | 19.08 | 44.30 | 67.00 | 35.00 | 1.00 | 3.00 | 2.00 | 3.00 | |
| **Population estimates** | | 71 | 133 | 137 | 48 | 8 | 8 | 3 | 7 | |
| **Probability of survival** | 0.95 | 0.98 | 0.95 | 0.39 | 0.02 | 0.23 | 0.25 | 0.75 | | |
| **95% confidence Interval for Population size** | | 51.3-128.1 | 93.5-237.7 | 99.4-232.8 | 47.6-277.9 | 7.5-122.9 | 9.2-62.0 | 6.8-27.8 | 6.8-27.8 | |

| 2kg/ha grid | Pre baiting | | | | | Post baiting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dates | 20-Apr | 21-Apr | 22-Apr | 23-Apr | 24-Apr | 28-Apr | 29-Apr | 30-Apr | 1-May | 2-May |
| Proportion marked | 0.03 | 0.44 | 0.34 | 0.43 | 0.56 | 0.05 | 0.33 | 0.33 | 0.42 | 0.30 |
| Size of marked population | 0.00 | 32.33 | 44.91 | 92.09 | 27.00 | 0.00 | 2.00 | 2.00 | 6.00 | |
| Population estimates | | 73 | 132 | 213 | 48 | 0 | 6 | 6 | 14 | |
| Probability of survival | 1.010 | 0.797 | 1.281 | 0.233 | 0.000 | 0.143 | 0.250 | 0.750 | | |
| 95% confidence Interval for Population size | | 57.9-112.6 | 94.7-229.9 | 136.1-445.6 | 0 | 0 | 6.0-51.6 | 6.0-26.3 | 11.1-34.6 | |

Where the estimates population size was lower than the actual number caught there was a failure of the confidence interval estimate to give a range that included the estimates population size. This may be in part due to a failure of the model to calculate estimates in the presence of ongoing mortality of mice. In all three treated sites no mouse was ever caught more than two days in a row post baiting. This suggests a continuing suppressive effect by residual bait.

***Table 25*** *Jolly-Seber population model outputs for untreated control sites.*

| Untreated Control (R5) | Pre baiting | | | | | Baiting | | | Post bating | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | 20-Apr | 21-Apr | 22-Apr | 23-Apr | 24-Apr | 25-Apr | 26-Apr | 27-Apr | 28-Apr | 29-Apr | 30-Apr | 1-May | 2-May |
| Proportion marked | 0.49 | 0.80 | 0.72 | 0.79 | 0.81 | 0.78 | 0.75 | 0.78 | 0.71 | 0.82 | 0.78 | 0.73 | 0.80 |
| Estimated size of marked population | 74.51 | 95.68 | 105.60 | 105.61 | 107.86 | 129.56 | 116.45 | 106.82 | 116.81 | 134.33 | 141.09 | 114.29 | 104.00 |
| Population estimate | 152 | 120 | 147 | 133 | 134 | 166 | 156 | 136 | 164 | 164 | 181 | 157 | 130 |
| Probability of survival | 1.00 | 1.01 | 0.89 | 0.97 | 1.16 | 0.88 | 0.87 | 1.01 | 1.02 | 1.00 | 0.77 | 0.84 | 0.92 |
| 95% confidence interval for population size | 117.7-196.3 | 103.3-133.3 | 124.7-176.1 | 114.0-147.7 | 117.2-148.1 | 134.0-193.9 | 129.6-183.1 | 119.5-165.5 | 135.4-196.0 | 124.9-179.8 | 128.6-205.0 | 121.1-228.2 | * |

** - Indicates that no estimate can be made for this parameter from the available data*

| Untreated control (R9) | Pre baiting | | | | | | Post bating | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Dates | 20-Apr | 21-Apr | 22-Apr | 23-Apr | 24-Apr | 28-Apr | 29-Apr | 30-Apr | 1-May | 2-May |
| **Proportion marked** | 0.04 | 0.24 | 0.46 | 0.55 | 0.78 | 0.80 | 0.88 | 0.85 | 0.72 | 0.79 |
| **Estimated size of marked population** | | 19.81 | 48.09 | 79.73 | 81.22 | 85.10 | 94.20 | 90.56 | 94.53 | 98.14 |
| **Population estimate** | | 83 | 105 | 144 | 104 | 106 | 107 | 107 | 131 | 124 |
| **Probability of survival** | 0.90 | 0.97 | 1.06 | 0.81 | 0.95 | 1.01 | 0.92 | 0.98 | 0.94 | 0.66 |
| **95% confidence interval for population size** | | 58.4-125.0 | 86.6-144.0 | 109.7-171.9 | 89.1-114.4 | 88.4-109.5 | 90.1-120.6 | 84.2-117.7 | 96.2-183.4 | * |

*Estimates for all parameters were able to be made across the entire trial as this site was also used in trial one and trial 3.*

*Estimates were able to me made up until the very end of this trial as the site was used in trial 3 which followed on immediately after this.*

### *10.3.2 Equal catchability*

The test for equal catchability was calculated differently for pre and post baiting. In the case of post baiting we know that massive mortality was occurring and few mice survived the bating. Post baiting the assumption for the Lesley Chitty and Chitty test for equal catchability was a better fit to the assumptions than the zero-truncated Poisson test, which was able to fit the assumptions present prior to baiting (Krebs 1994). The exception was for the untreated control where capture data for both pre and post baiting were tested using the zero truncated test fit to a Poisson distribution. Post baiting there as insufficient data from the 1kg/ha grid to calculate any kind of test for equal catchability.

***Table 26** Zero-truncated Poisson test for equal catchability for pre baiting data only*

| Site | Level of significance | Degrees of freedom | Chi-Squ value | Critical Value | Finding |
|---|---|---|---|---|---|
| 0.5kg/ha | 0.05 | 1 | 0.01 | 3.841 | Not significant |
| 1kg/ha | 0.05 | 2 | 3.94 | 5.991 | Not significant |
| 2kg/ha | 0.05 | 2 | 5.89 | 5.991 | Not significant but approaching significance. |
| Untreated control (R5) Pre baiting | 0.05 | 2 | 4.16 | 5.991 | Not significant but approaching significance. |
| Untreated control (R5) Post baiting | 0.05 | 2 | 1.46 | 5.991 | Not significant |
| Untreated Control (R9) Pre baiting | 0.05 | 2 | 0.78 | 5.991 | Not significant |
| Untreated Control (R9) Post baiting | 0.05 | 2 | 10.57 | 5.991 | Significant. Evidence suggests unequal catchability |

These tests were not significant. There is no evidence that mice are not equally catchable. With the exception of the UTC (R9) post baiting data

***Table 27** Leslie Chitty and Chitty test for equal catchability for post baiting*

| Site | Predicted values of Z(t) | Standard error of predicted Z(t) * | Observed values | Difference |
|---|---|---|---|---|
| 0.5kg/ha | 8.5 | 10.2 | 8.0 | 0.5 |
| 1kg/ha | Unable to calculate. Too few captures | | | |
| 2kg/ha | 8.7 | Unable to calc. | 10 | 1.3 |
| UTC (R9) | 21.0 | 19.8 | 16.0 | 5.0 |
| UTC (R9) All trial data | 66.7 | 91.8 | 88.0 | 21.3 |

No matter how the trial data for Untreated Control (R9) was tested it failed tests for equal catchability, suggesting that model estimates for population size are unreliable.

The differences in the treated grids between observed and predicted values using Leslie, Chitty and Chitty are relatively small and do not appear to be biologically meaningful we therefore conclude that the is not enough evidence in treated grids post baiting that mice are not equally catchable.

## 10.4 Talc burrows.

***Table 28** Number of talc burrows active in each site for each night*

| Site | Pre Baiting | | | | | Post Baiting | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 111 | 112 | 113 | 114 | Average | 118 | 119 | 120 | 121 | 122 | Average |
| **0.5kg/ha** | 6 | 6 | 6 | 5 | 5.75 | 0 | 2 | washed out | 3? (rain) | 2 | 1.33 |
| **1kg/ha** | 9 | 8 | ND | 6 | 7.67 | 3 | 1 | Washed out | 2? (rain) | 1 | 1.67 |
| **2kg/ha** | 7 | 8 | 7 | 6 | 7.00 | 1 | 2 | Washed out | 3? (rain) | 2 | 1.67 |
| **UTC(R5)** | 10 | 10 | 8 | 10 | 9.50 | 9 | 9 | 7 | 7 | 5 | 7.40 |
| **UTC(R9)** | 4 | 4 | 3 | 8 | 4.75 | 10 | 9 | Washed out | 8? | 8 | 9.00 |

ACIA

## 10.5 Census card data

***Table 29*** *The amount of census card consumed by mice for a single night pre and post baiting*

| | Pre baiting | | | | | | Post baiting | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Julian date** | **111** | **111** | **111** | **111** | **111** | **Julian date** | **118** | **118** | **118** | **119** | **119** |
| **Card #** | **0.5kg/ha** | **1kg/ha** | **2kg/ha** | **UTC (R5)** | **UTC (R9)** | **Card #** | **0.5kg/ha** | **1kg/ha** | **2kg/ha** | **UTC (R5)** | **UTC (R9)** |
| **1** | 16 | 22 | 5 | 5 | 15 | **1** | 0 | 0 | 0 | 3 | 54 |
| **2** | 45 | 28 | 24 | 30 | 59 | **2** | 0 | 0 | 0 | 18 | 100 |
| **3** | 48 | 20 | 18 | 77 | 95 | **3** | 0 | 0 | 0 | 21 | 100 |
| **4** | 39 | 15 | 65 | 24 | 84 | **4** | 0.5 | 0 | 0 | 15 | 27 |
| **5** | 84 | 31 | 100 | 5 | 97 | **5** | 0 | 0 | 0 | 3 | 73 |
| **6** | 59 | 40 | 99 | 63 | 29 | **6** | 0 | 0 | 0 | 4 | 48 |
| **7** | 35 | 85 | 12 | 19 | 48 | **7** | 0.5 | 0 | 0 | 8 | 42 |
| **8** | 7 | 31 | 21 | 24 | 65 | **8** | 0 | 0 | 0 | 8 | 59 |
| **9** | 19 | 1 | 17 | 35 | 41 | **9** | 0 | 0.5 | 0 | 45 | 54 |
| **10** | 25 | 1 | 49 | 9 | 69 | **10** | 0 | 0 | 0 | 55 | 57 |
| **11** | 37 | 0 | 20 | 40 | 89 | **11** | 0 | 0 | 0 | 82 | 100 |
| **12** | 99 | 0 | 0.5 | 14 | 18 | **12** | 0 | 0 | 0 | 10 | 58 |
| **13** | 37 | 0.5 | 14 | 5 | 80 | **13** | 0.5 | 0 | 0.5 | 7 | 35 |
| **14** | 9 | 0 | 29 | 64 | 61 | **14** | 0 | 0 | 0 | 13 | 45 |
| **15** | 0 | 1 | 19 | 3 | 52 | **15** | 0.5 | 0 | 0 | 16 | 47 |
| **16** | 0 | 21 | 2 | 50 | 23 | **16** | 0 | 0 | 0 | 1 | 58 |
| **17** | 13 | 28 | 15 | 8 | 63 | **17** | 0 | 0 | 0 | 0.5 | 100 |
| **18** | 17 | 0.5 | 40 | 16 | 36 | **18** | 3 | 0 | 0 | 0.5 | 60 |
| **19** | 38 | 7 | 4 | 2 | 55 | **19** | 0 | 0 | 0 | 9 | 31 |
| **20** | 25 | 2 | 37 | 8 | 49 | **20** | 0 | 0 | 0 | 48 | 65 |
| **Average** | **32.60** | **16.70** | **29.52** | **25.05** | **56.40** | **Average** | **0.25** | **0.025** | **0.025** | **18.35** | **60.65** |
| **Sts. Dev.** | **25.95** | **20.95** | **28.84** | **22.86** | **24.79** | **Sts. Dev.** | **0.67** | **0.11** | **0.11** | **21.94** | **23.04** |
| | **Untreated Control (UTC) Average** | | | **40.95** | | | **Untreated Control (UTC) Average** | | | **39.50** | |

## 10.6 Spotlight counts

***Table 30** Spotlight count data recorded for each site*

| Site | Pre baiting Date | Pre baiting Number of Mice | Post baiting Date | Post baiting Number of Mice |
|---|---|---|---|---|
| 0.5kg/ha | 20/04/2011 | 2 | 27/04/2011 | 0 |
| | 22/04/2011 | 14 | 28/04/2011 | 0 |
| | 23/04/2011 | 4 | 29/04/2011 | 0 |
| | **Average** | 6.6 | **Average** | 0 |
| 1kg/ha | 20/04/2011 | 1 | 27/04/2011 | 0 |
| | 22/04/2011 | 7 | 28/04/2011 | 2 |
| | 23/04/2011 | 6 | 29/04/2011 | 1 |
| | **Average** | 4.6 | **Average** | 1 |
| 2kg/ha | 20/04/2011 | 8 | 27/04/2011 | 0 |
| | 22/04/2011 | 13 | 28/04/2011 | 0 |
| | 23/04/2011 | 8 | 29/04/2011 | 0 |
| | **Average** | 9.6 | **Average** | 0 |
| UTC (R5) | 20/04/2011 | 5 | 27/04/2011 | 9 |
| | 22/04/2011 | 8 | 28/04/2011 | 10 |
| | 23/04/2011 | 2 | 29/04/2011 | 12 |
| | **Average** | 5 | **Average** | 10 |
| UTC(R9) | 20/04/2011 | 3 | 27/04/2011 | 6 |
| | 22/04/2011 | 5 | 28/04/2011 | 6 |
| | 23/04/2011 | 1 | 29/04/2011 | 6 |
| | **Average** | 3 | **Average** | 6 |

## 10.7 Multiple captures within traps

The following tables show the individuals caught together within the intensive monitoring grids. The tables indicate trap number and date. Where individual mice were captured on multiple occasions in a multi capture situation these are highlighted. There were far more occasions for multiple captures on the untreated control grids because they had a pervious trapping history before this trial (used as control grids for Trial 1 Report MO2011/004A) and because these mice were not challenged with MOUSEOFF® Zinc Phosphide Bait and so mouse social structures remained relatively intact.

***Table 31*** *Place, date and the tag number of individual mice caught together in a single trap 0.5kg/ha monitoring grid*

| 0.5kg/ha – RAM 08 | | |
|---|---|---|
| Tag number of mice caught together | Trap number | Day of capture |
| 1385 - 1188 | 11B | 23/4/2011 |
| 1387 - 1122 | 13A | 23/4/2011 |
| 1412 - 1375 | 4A | 23/4/2011 |
| 1556 - 1379 | 14A | 24/4/2011 |
| 1559 – 1560 - 1195 | 19A | 24/4/2011 |
| 1562 - 1199 | 23B | 24/4/2011 |
| 1411 - 1381 | 3B | 24/4/2011 |

*42% of multiple captures occurred in the middle of the grid*

***Table 32*** *Place, date and the tag number of individual mice caught together in a single trap, 1kg/ha monitoring grid*

| 1kg/ha – RAM 07 | | |
|---|---|---|
| Tag number of mice caught together | Trap number | Day of capture |
| 1514 – 1515 | 16B | 23/4/2011 |
| 1403 – 1142 | 19A | 23/4/2011 |
| 1512 – 1296 | 15B | 24/4/2011 |
| 1513 – 1141 | 16B | 24/4/2011 |
| 1220 - 1144 | 21A | 24/4/2011 |

*20% of captures occurred in the middle of the grid*

***Table 33*** *Place, date and the tag number of individual mice caught together in a single trap, 2kg/ha monitoring grid*

| 2kg/ha – RAM 06 | | |
|---|---|---|
| Tag number of mice caught together | Trap number | Day of capture |
| 1232 – 1151 | 4B | 22/4/2011 |
| 1494 – 1495 | 16B | 22/4/2011 |
| 1250 - 1175 | 22B | 22/4/2011 |

*0% of captures occurred in the middle of the grid*

All of the multiple captures that occurs within the 2kg/ha grid occurred on the edge of the grid. The untreated control grids caught 36% and 43% of mice in the centre of the grid on R9 and R5 respectively. 36% of all the traps are located in the centre of the grid and so if mice are moving randomly we would expect around the same percentage of all multiple captures to occur in the centre. In the 0.5kg/ha and UTC (R5) grids it was higher than this while in the 1kg/ha and the 2kg/ha it was lower but in the UTC (R9) it was exactly 36%. The sites where it is lower it may be more likely that mice are moving into the grid and so activity along edges is increased. Whereas on grids where it is higher it may be more accurate to predict that a number of mice are site attached and these are continually getting caught together. However this variation in capture location may simply be an artefact of the random grid placement.

Within untreated control R9 there were 7 individual mice that were caught on multiple occasions within a trap with other mice.

***Table 34*** *Place, date and the tag number of individual mice caught together in a single trap, untreated control (R9) monitoring grid*

| Untreated Control (R9) – RAM 09 | | | | |
|---|---|---|---|---|
| Mouse 1 | Mouse 2 | Mouse 3 | Trap | Date |
| 1327 | 1328 | | 11A | 21/04/2011 |
| 1456 | 1090 | 1455 | 5B | 22/04/2011 |
| 1360 | 1327 | | 11B | 23/04/2011 |
| 1352 | 1319 | | 1A | 23/04/2011 |
| 1455 | 1088 | 1454 / 1320 | 5A | 23/04/2011 |
| 1458 | 1357 | | 9A | 23/04/2011 |
| 1452 | 1453 | | 4A | 24/04/2011 |
| 1655 | 1610 | | 10A | 28/04/2011 |
| 1100 | 1096 | | 13A | 28/04/2011 |
| 1614 | 1475 | 1339 | 23A | 28/04/2011 |
| 1453 | 1083 | | 3B | 28/04/2011 |
| 1652 | 1097 | 1653 | 8A | 28/04/2011 |
| 1096 | 1094 | | 13A | 29/04/2011 |
| 1363 | 1321 | | 15B | 29/04/2011 |
| 1653 | 1084 | | 8A | 29/04/2011 |
| 1811 | 1652 | 1809 | 8A | 30/04/2011 |
| 1875 | 1096 | | 13B | 1/05/2011 |
| 1613 | 1369 | | 22A | 1/05/2011 |
| 1615 | 1476 | | 24B | 1/05/2011 |
| 1849 | 1319 | | 4B | 1/05/2011 |
| 1851 | 1652 | | 8B | 1/05/2011 |
| 1477 | 1370 | | 25B | 2/04/2011 |

Within R5, 16 individual mice were caught on multiple occasions with multiple mice. There were three pairings where the same two mice were caught together twice. Tag numbers 1618 and 881 were caught together on the 28/04/2011 and then again on the same trap station the next day. Tag numbers 1618 with 1080 / 1619 were caught together on the 25/04/2011 then again 6 days later on the same trap station. Tag numbers 1072 with 1019 were caught together on the 21/04/2011 then again 7 days later in the same traps again. On all of these occasions mice were trapped on the same trap station on multiple occasions suggesting some kind of site attachment.

***Table 35*** *Place, date and the tag number of individual mice caught together in a single trap, untreated control (R5) monitoring grid.*

| Untreated Control (R5) – RAM 05 | | | | | |
|---|---|---|---|---|---|
| Mouse 1 | Mouse 2 | Mouse 3 | Mouse 4 | Trap | Date |
| 776 | 1080/1619 | | | 20A | 28/04/2011 |
| 781 | 762 | | | 2B | 1/05/2011 |
| 804 | 778 | | | 19A | 22/04/2011 |
| 821 | 874/1307 | | | 14B | 21/04/2011 |
| 874 | 817 | | | 13B | 22/04/2011 |
| 881 | 1308/1444 | 2040/1346 | | 19A | 23/04/2011 |

| Untreated Control (R5) – RAM 05 | | | | | |
|---|---|---|---|---|---|
| Mouse 1 | Mouse 2 | Mouse 3 | Mouse 4 | Trap | Date |
| 881 | 806 | | | 19B | 22/04/2011 |
| 881 | 885 | | | 20A | 26/04/2011 |
| 881 | 1078 / 1646 | 1618 | | 20B | 28/04/2011 |
| 1020 | 773 | 878 | | 17B | 26/04/2011 |
| 1020 | 1072 | | | 17B | 30/04/2011 |
| 1062 | 785 | | | 9B | 23/04/2011 |
| 1072 | 1019 | | | 17A | 21/04/2011 |
| 1072 | 1019 | | | 17B | 28/04/2011 |
| 1314 | 1081 | | | 25B | 30/04/2011 |
| 1348 | 1076 | | | 22A | 30/04/2011 |
| 1349 | 1311 | | | 22B | 1/05/2011 |
| 1436 | 810 | | | 4B | 1/05/2011 |
| 1448 | 1313 | | | 24B | 25/04/2011 |
| 1448 | 1310 | | | 24B | 29/04/2011 |
| 1604 | 1073 | | | 21A | 29/04/2011 |
| 1616 | 1077 | | | 6A | 25/04/2011 |
| 1618 | 881 | | | 20A | 29/04/2011 |
| 1618 | 1080 / 1619 | | | 20A | 1/05/2011 |
| 1618 | 884 | | | 20A | 2/05/2011 |
| 1623 | 790 | 1622 | | 6A | 27/04/2011 |
| 1634 | 810 | | | 4A | 28/04/2011 |
| 1636 | 1616 | | | 6B | 28/04/2011 |
| 1643 | 820 | 1665 | | 14A | 30/04/2011 |
| 1647 | 1648 | | | 22B | 28/04/2011 |
| 1668 | 1605 | | | 23B | 30/04/2011 |
| 1820 | 1650 | 1821 | 1822 | 25A | 30/04/2011 |
| 1857 | 1064 | | | 5A | 1/05/2011 |
| 1866 | 2080 / 1620 | 1865 | 1864 | 25A | 1/05/2011 |
| 1884 | 1859 / 1883 | | | 6B | 2/05/2011 |
| 1080 / 1619 | 1618 / 805 | | | 20A | 25/04/2011 |
| 1082 / 1641 | 1859 / 875 | | | 14A | 28/04/2011 |
| 1308 / 1444 | 1080 / 1619 | | | 19A | 2/05/2011 |
| 1618 / 805 | 806 | | | 19B | 24/04/2011 |
| 1858 / 1885 | 1306 / 1438 | | | 13A | 2/05/2011 |
| 1858 / 1885 | 1616 | | | 6B | 1/05/2011 |
| 1860 / 2039 | 1859 / 875 | | | 14B | 1/05/2011 |
| 2040 / 1346 | 804 / 1629 | | | 19B | 30/04/2011 |
| 804 / 1629 | 1308 / 1444 | | | 19A | 29/04/2011 |
| 874 / 1307 | 1859 / 875 | | | 13A | 24/04/2011 |
| Blue2 | 1070 | | | 14B | 26/04/2011 |

Traps at each trapping station on the grid were assigned either A or B to differentiate between mice caught within different traps at each trapping station.

ACTA

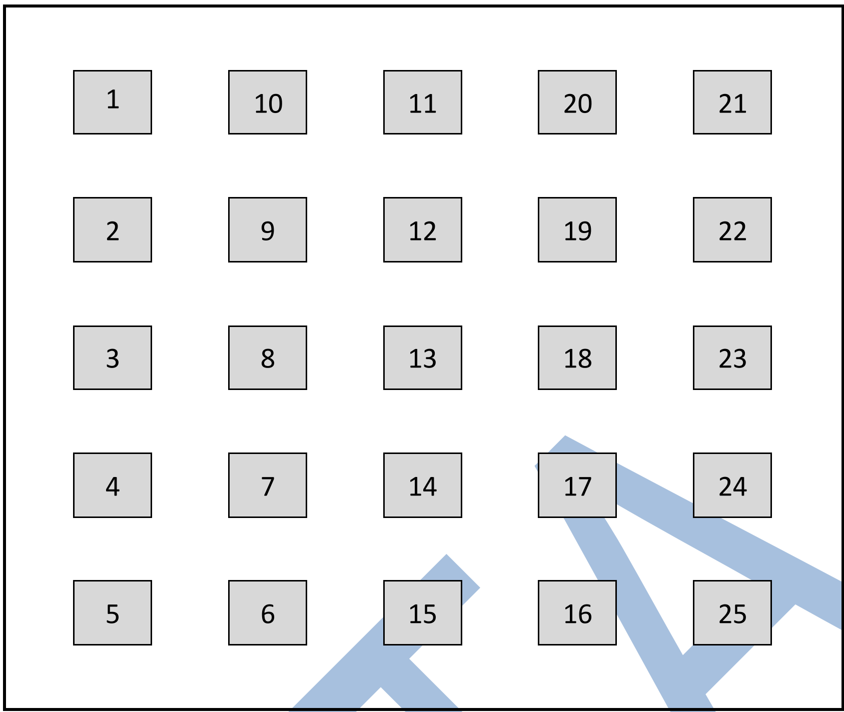


***Figure 25*** *Trap numbering layout in all monitoring grids.*

## 10.8 Bait uptake

***Table 36*** *Bait up take*

| | 27-Mar | 28-Mar | 29-Mar | 30-Mar | 1-May | 2-May | 3-May | 4-May |
|---|---|---|---|---|---|---|---|---|
| **0.5kg/ha** | | | | | | | | |
| Grid1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| Grid 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grid 3 | 0 | FoxP | 1 | 0 | 0 | 0 | 1 | 0 |
| Grid 4 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | FoxS |
| Total | 8 | 2 | 2 | 0 | 0 | 1 | 1 | 0 |
| % uptake | 40.00% | 10.00% | 10.00% | 0.00% | 0.00% | 5.00% | 5.00% | 0.00% |
| **1kg/ha** | | | | | | | | |
| Grid1 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| Grid 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Grid 3 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| Grid 4 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| Total | 4 | 1 | 0 | 3 | 3 | 2 | 0 | 0 |
| % uptake | 0.2 | 0.05 | 0 | 0.15 | 0.15 | 0.1 | 0 | 0 |
| **2kg/ha** | | | | | | | | |
| Grid1 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 |
| Grid 2 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 |
| Grid 3 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| Grid 4 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 1 |
| Total | 0 | 1 | 1 | 6 | 7 | 1 | 0 | 1 |
| % uptake | 0 | 0.05 | 0.05 | 0.3 | 0.35 | 0.05 | 0 | 0.05 |

FoxP = Fox print, FoxS = fox scat.

## 10.9 Pre and post trial mouse activity using snap trap data

***Table 37*** *Details of mouse snap trap surveys*

| TREATMENT SITE | DATE | PRE/POST TRIAL | No. OF TRAPS | MALFUNCTION | FAIL | UNSPRUNG | CAPTURE | TS | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| **2kg/ha** | 31/03/2011 | Pre trial | 20 | 1 | 14 | 1 | 4 | 33.33% | |
| **2kg/ha** | 7/05/2011 | Post trial | 16 | 1 | 2 | 11 | 1 | 7.14% | |
| **2kg/ha** | 10/05/2011 | Post trial | 16 | 0 | 2 | 14 | 0 | 0.00% | |
| **2kg/ha** | 25/05/2011 | Post trial | 10 | 1 | 1 | 8 | 0 | 0.00% | |
| **1kg/ha** | 2/04/2011 | Pre trial | 10 | 2 | 8 | 0 | 0 | 0.00% | Highly disturbed site 2 traps missing. Many traps moved. |
| **1kg/ha** | 7/05/2011 | Post trial | 16 | 4 | 0 | 12 | 0 | 0.00% | |
| **1kg/ha** | 10/05/2011 | Post trial | 16 | 2 | 1 | 10 | 3 | 22.22% | |
| **1kg/ha** | 25/05/2011 | Post trial | 10 | 1 | 0 | 6 | 3 | 33.33% | Active mouse hole observed nearby |
| **0.5kg/ha** | 2/04/2011 | Pre trial | 10 | 2 | 1 | 0 | 7 | 93.33% | 2 traps missing Fox den found in area |
| **0.5kg/ha** | 25/05/2011 | Post trial | 10 | 1 | 1 | 8 | 0 | 0.00% | |

## 10.10 Trapping history

***Table 38*** *Individual trapping history for all mice in Trial 2.*

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| **1031** | | 1 | | | | | | | | | | | | 1 |
| **1083** | 1 | | 1 | | | | | | 1 | 1 | 1 | | | 5 |
| **1084** | 1 | 1 | | | | | | | | 1 | | | 1 | 4 |
| **1085** | 1 | | | | | | | | 1 | 1 | | | 1 | 4 |
| **1086** | 1 | | | | | | | | | | 1 | | | 2 |
| **1087** | 1 | | 1 | 1 | 1 | | | | | | | 1 | 1 | 6 |
| **1088** | 1 | 1 | | 1 | 1 | | | | 1 | | 1 | | 1 | 7 |
| **1089** | 1 | | 1 | 2 | 1 | | | | | | 1 | | | 6 |
| **1090** | 1 | | 1 | | 1 | | | | | | | 1 | | 4 |
| **1091** | 1 | | | | | | | | | | | | | 1 |
| **1092** | 1 | 1 | 1 | | | | | | | | | | | 3 |
| **1093** | 1 | | | 1 | 1 | | | | | | | | | 3 |
| **1094** | 1 | | | 1 | 1 | | | | | 1 | | | | 4 |
| **1095** | 1 | 1 | 1 | | | | | | 1 | 1 | | | | 5 |
| **1096** | 1 | 1 | | 1 | 1 | | | | 1 | 1 | 1 | 1 | | 8 |
| **1097** | 1 | 1 | | | 1 | | | | 1 | 1 | 1 | | | 6 |
| **1098** | 1 | | | | | | | | | | | | | 1 |
| **1099** | 1 | 1 | 1 | 1 | | | | | | | | | | 4 |
| **1100** | 1 | 1 | 1 | | | | | | 1 | 1 | | | 1 | 6 |
| **1116** | 1 | 1 | 1 | | | | | | | | | | | 3 |
| **1117** | 1 | 1 | | | 1 | | | | | | | | | 3 |
| **1118** | 1 | 1 | | | | | | | | | | | | 2 |
| **1119** | 1 | 1 | 1 | 1 | 1 | | | | | | | | | 5 |
| **1120** | 1 | 1 | | | | | | | | | | | | 2 |
| **1121** | 1 | | | | | | | | | | | | | 1 |
| **1122** | 1 | 1 | | 1 | 1 | | | | | | | | | 4 |
| **1123** | 1 | | | 1 | | | | | | | | | | 2 |
| **1124** | 1 | | 1 | | 1 | | | | | | | | | 3 |
| **1125** | 1 | | 1 | | | | | | | | | | | 2 |
| **1126** | 1 | | | | | | | | | | | | | 1 |
| **1127** | 1 | 1 | | 1 | 1 | | | | | | | | | 4 |
| **1128** | 1 | | | | | | | | | | | | | 1 |
| **1129** | 1 | 1 | | | | | | | | | | | | 2 |
| **1130** | 1 | | | | | | | | | | | | | 1 |
| **1131** | 1 | | | | 1 | | | | | | | | | 2 |
| **1132** | 1 | 1 | 1 | 1 | | | | | | | | | | 4 |
| **1133** | 1 | | 1 | 1 | 1 | | | | | | | | | 4 |
| **1134** | 1 | 1 | 1 | 1 | 1 | | | | | | | | | 5 |
| **1135** | 1 | 1 | 1 | 1 | 1 | | | | | | | | | 5 |
| **1136** | 1 | | | | 1 | | | | | | | | | 2 |
| **1137** | 1 | | | | | | | | | | | | | 1 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| 1138 | 1 | 1 | | | | | | | | | | | | 2 |
| 1139 | 1 | | 1 | | 1 | | | | | | | | | 3 |
| 1140 | 1 | 1 | | | 1 | | | | | | | | | 3 |
| 1141 | 1 | 1 | | | 1 | | | | | | | | | 3 |
| 1142 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | 5 |
| 1143 | 1 | | | | 1 | | | | | | | | | 2 |
| 1144 | 1 | 1 | 1 | | 1 | | | | | | | | | 4 |
| 1145 | 1 | | | 1 | 1 | | | | | | | | | 3 |
| 1146 | 1 | | 1 | | 1 | | | | | | | | | 3 |
| 1147 | 1 | | | | | | | | | | | | | 1 |
| 1148 | 1 | | | | | | | | | | | | | 1 |
| 1149 | 1 | 1 | | | | | | | | | | | | 2 |
| 1150 | 1 | 1 | 1 | | 1 | | | | | | | | | 4 |
| 1151 | 1 | 1 | 1 | | | | | | | | | | | 3 |
| 1152 | 1 | | | | | | | | | | | | | 1 |
| 1153 | 1 | | | 1 | | | | | | | | | | 2 |
| 1154 | 1 | | | | | | | | | | | | | 1 |
| 1155 | 1 | 1 | | | | | | | | | | | | 2 |
| 1156 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | 5 |
| 1157 | 1 | 1 | | 1 | 1 | | | | | | | | | 4 |
| 1158 | 1 | | 1 | | 1 | | | | | | | | | 3 |
| 1159 | 1 | 1 | | 1 | | | | | | | | | | 3 |
| 1160 | 1 | | | | | | | | | | | | | 1 |
| 1161 | 1 | 1 | 1 | | 1 | | | | | | | | | 4 |
| 1162 | 1 | | 1 | | | | | | | | | | | 2 |
| 1163 | 1 | 1 | | 1 | 1 | | | | | | | | | 4 |
| 1164 | 1 | 1 | 1 | | 1 | | | | | | | | | 4 |
| 1165 | 1 | | | | | | | | | | | | | 1 |
| 1166 | 1 | | | | | | | | | | | | | 1 |
| 1167 | 1 | | 1 | | 1 | | | | | | | | | 3 |
| 1168 | 1 | | | | | | | | | | | | | 1 |
| 1169 | 1 | 1 | | 1 | | | | | | | | | | 3 |
| 1170 | 1 | | | | | | | | | | | | | 1 |
| 1171 | 1 | 1 | | | | | | | | | | | | 2 |
| 1172 | 1 | | 1 | | | | | | | | | | | 2 |
| 1173 | 1 | 1 | | 1 | | | | | | | | | | 3 |
| 1174 | 1 | | | | 1 | | | | | | | | | 2 |
| 1175 | 1 | 1 | 1 | 1 | | | | | | | | | | 4 |
| 1176 | 1 | | | | 1 | | | | | | | | | 2 |
| 1177 | 1 | 1 | | | | | | | | | | | | 2 |
| 1178 | 1 | | | | | | | | | | | | | 1 |
| 1179 | 1 | | 1 | | 1 | | | | | | | | | 3 |
| 1180 | | 1 | | | | | | | | | | | | 1 |
| 1181 | | 1 | | | | | | | | | | | | 1 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| 1183 | | 1 | | 1 | | | | | | | | | | 2 |
| 1184 | | 1 | 1 | 1 | | | | | | | | | | 3 |
| 1185 | | 1 | | | | | | | | | | | | 1 |
| 1186 | | 1 | | 1 | 1 | | | | | | | | | 3 |
| 1187 | | 1 | | | | | | | | | | | | 1 |
| 1188 | | 1 | | 1 | | | | | | | | | | 2 |
| 1189 | | 1 | | | | | | | | | | | | 1 |
| 1190 | | 1 | 1 | | 1 | | | | | | | | | 3 |
| 1191 | | 1 | | | | | | | | | | | | 1 |
| 1192 | | 1 | | | 1 | | | | | | | | | 2 |
| 1193 | | 1 | 1 | | | | | | | | | | | 2 |
| 1194 | | 1 | | | | | | | | | | | | 1 |
| 1195 | | 1 | | 1 | 1 | | | | | | | | | 3 |
| 1196 | | 1 | | | | | | | | | | | | 1 |
| 1197 | | 1 | | | | | | | | | | | | 1 |
| 1198 | | 1 | | | 1 | | | | | | | | | 2 |
| 1199 | | 1 | 1 | | 1 | | | | | | | | | 3 |
| 1200 | | 1 | | | | | | | | | | | | 1 |
| 1201 | | 1 | | | | | | | | | | | | 1 |
| 1202 | | 1 | 1 | | | | | | | | | | | 2 |
| 1203 | | 1 | | | 1 | | | | | | | | | 2 |
| 1204 | | 1 | | 1 | | | | | | | | | | 2 |
| 1205 | | 1 | 1 | 1 | 1 | | | | | | | | | 4 |
| 1206 | | 1 | | | | | | | | | | | | 1 |
| 1207 | | 1 | 1 | | | | | | | | | | | 2 |
| 1208 | | 1 | | 1 | | | | | | | | | | 2 |
| 1209 | | 1 | | | | | | | | | | | | 1 |
| 1210 | | 1 | | | 1 | | | | | | | | | 2 |
| 1211 | | 1 | | 1 | | | | | | | | | | 2 |
| 1212 | | 1 | | 1 | | | | | | | | | | 2 |
| 1213 | | 1 | | | | | | | | | | | | 1 |
| 1214 | | 1 | | | | | | | | | | | | 1 |
| 1215 | | 1 | 1 | 1 | 1 | | | | | | | | | 4 |
| 1216 | | 1 | | 1 | | | | | | | | | | 2 |
| 1218 | | 1 | | | | | | | | | | | | 1 |
| 1219 | | 1 | | 1 | | | | | | | | | | 2 |
| 1220 | | 1 | | | 1 | | | | | | | | | 2 |
| 1221 | | 1 | | 1 | | | | | | | | | | 2 |
| 1222 | | 1 | | | | | | | | | | | | 1 |
| 1223 | | 1 | | | 1 | | | | | | | | | 2 |
| 1224 | | 1 | | 1 | | | | | | | | | | 2 |
| 1225 | | 1 | | | | | | | | | | | | 1 |
| 1226 | | 1 | | | | | | | | | | | | 1 |
| 1227 | | 1 | 1 | 1 | | | | | | | | | | 3 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| 1228 | | 1 | | | | | | | | | | | | 1 |
| 1229 | | 1 | | 1 | | | | | | | | | | 2 |
| 1230 | | 1 | | | | | | | | | | | | 1 |
| 1231 | | 1 | | 1 | | | | | | | | | | 2 |
| 1232 | | 1 | 1 | | | | | | | | | | | 2 |
| 1233 | | 1 | | | | | | | | | | | | 1 |
| 1234 | | 1 | | 1 | 1 | | | | | | | | | 3 |
| 1235 | | 1 | | | | | | | | | | | | 1 |
| 1236 | | 1 | | | 1 | | | | | | | | | 2 |
| 1237 | | 1 | | | | | | | | | | | | 1 |
| 1238 | | 1 | | | 1 | | | | | | | | | 2 |
| 1240 | | 1 | | | | | | | | | | | | 1 |
| 1241 | | 1 | | | 1 | | | | | | | | | 2 |
| 1242 | | 1 | 1 | | | | | | | | | | | 2 |
| 1243 | | 1 | | | | | | | | | | | | 1 |
| 1244 | | 1 | | | | | | | | | | | | 1 |
| 1245 | | 1 | | | | | | | | | | | | 1 |
| 1246 | | 1 | | | | | | | | | | | | 1 |
| 1247 | | 1 | | | | | | | | | | | | 1 |
| 1248 | | 1 | | | | | | | | | | | | 1 |
| 1249 | | 1 | | 1 | | | | | | | | | | 2 |
| 1250 | | 1 | | 1 | 1 | | | | | | | | | 3 |
| 1251 | | 1 | | | | | | | | | | | | 1 |
| 1252 | | 1 | | | | | | | | | | | | 1 |
| 1253 | | 1 | | | | | | | | | | | | 1 |
| 1254 | | 1 | | | | | | | | | | | | 1 |
| 1255 | | | 1 | | | | | | | | | | | 1 |
| 1256 | | | 1 | | | | | | | | | | | 1 |
| 1257 | | | 1 | | | | | | | | | | | 1 |
| 1258 | | | 1 | | 2 | | | | | | | | | 3 |
| 1259 | | | 1 | | | | | | | | | | | 1 |
| 1260 | | | 1 | | | | | | | | | | | 1 |
| 1261 | | | 1 | | | | | | | | | | | 1 |
| 1262 | | | 1 | | 1 | | | | | | | | | 2 |
| 1263 | | | 1 | | | | | | | | | | | 1 |
| 1264 | | | 1 | | | | | | | | | | | 1 |
| 1265 | | | 1 | | 1 | | | | | | | | | 2 |
| 1266 | | | 1 | 1 | 1 | | | | | | | | | 3 |
| 1267 | | | 1 | | | | | | | | | | | 1 |
| 1268 | | | 1 | 1 | | | | | | | | | | 2 |
| 1269 | | | 1 | | | | | | | | | | | 1 |
| 1270 | | | 1 | 1 | 1 | | | | | | | | | 3 |
| 1271 | | | 1 | | | | | | | | | | | 1 |
| 1272 | | | 1 | 1 | 1 | | | | | | | | | 3 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| **1273** | | | 1 | 1 | 1 | | | | | | | | | 3 |
| **1274** | | | 1 | | 1 | | | | | | | | | 2 |
| **1276** | | | 1 | | | | | | | | | | | 1 |
| **1277** | | | 1 | | 1 | | | | | | | | | 2 |
| **1278** | | | 1 | | | | | | | | | | | 1 |
| **1279** | | | 1 | 1 | | | | | | | | | | 2 |
| **1280** | | | 1 | | | | | | | | | | | 1 |
| **1281** | | | 1 | | | | | | | | | | | 1 |
| **1282** | | | 1 | | 1 | | | | | | | | | 2 |
| **1283** | | | 1 | 1 | | | | | | | | | | 2 |
| **1284** | | | 1 | 1 | 1 | | | | | | | | | 3 |
| **1285** | | | 1 | | | | | | | | | | | 1 |
| **1286** | | | 1 | | | | | | | | | | | 1 |
| **1287** | | | 1 | | 1 | | | | | | | | | 2 |
| **1288** | | | 1 | | | | | | | | | | | 1 |
| **1289** | | | 1 | | | | | | | | | | | 1 |
| **1290** | | | 1 | | | | | | | | | | | 1 |
| **1291** | | | 1 | | 1 | | | | 1 | 1 | | | 1 | 5 |
| **1292** | | | 1 | | 1 | | | | | | | | | 2 |
| **1293** | | | 1 | 1 | | | | | | | | | | 2 |
| **1294** | | | 1 | | | | | | | | | | | 1 |
| **1295** | | | 1 | 1 | | | | | | | | | | 2 |
| **1296** | | | 1 | | 1 | | | | | | | | | 2 |
| **1297** | | | 1 | | | | | | | | | | | 1 |
| **1298** | | | 1 | | | | | | | | | | | 1 |
| **1299** | | | 1 | 1 | | | | | | | | | | 2 |
| **1300** | | | 1 | | | | | | | | | | | 1 |
| **1301** | 1 | | | | 1 | | | | 1 | | 1 | 1 | | 5 |
| **1302** | 1 | 1 | 1 | 1 | 1 | | | | | 1 | | | | 6 |
| **1303** | 1 | | | | 1 | | | | | | | | 1 | 3 |
| **1304** | 1 | | | | | | | | | | | | | 1 |
| **1311** | | 1 | | | 1 | | | | | | | 1 | | 3 |
| **1315** | | 1 | 1 | | 1 | | | | | 1 | 1 | 1 | 1 | 7 |
| **1316** | | 1 | | | 1 | | | | | | | | | 2 |
| **1317** | | 1 | 1 | | | | | | | | | | | 2 |
| **1318** | | 1 | 1 | | 1 | | | | | 1 | 1 | | | 5 |
| **1319** | | 1 | 1 | 1 | 1 | | | | | | | 1 | | 5 |
| **1321** | | 1 | | 1 | | | | | | 1 | | | | 3 |
| **1322** | | 1 | | 1 | | | | | 1 | 1 | 1 | | | 5 |
| **1323** | | 1 | | | | | | | | | | | | 1 |
| **1324** | | 1 | | 1 | 1 | | | | 1 | 1 | 1 | | | 6 |
| **1325** | | 1 | 1 | | | | | | | | | | | 2 |
| **1326** | | 1 | 1 | | 1 | | | | 1 | | 1 | | | 5 |
| **1327** | | 1 | | 1 | 1 | | | | 1 | | 1 | | 1 | 6 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| 1328 | | 1 | | | | | | | 1 | 1 | | 1 | | 4 |
| 1329 | | 1 | | | 1 | | | | | | 1 | | | 3 |
| 1330 | | 1 | | 1 | 1 | | | | 1 | 1 | 1 | | 1 | 7 |
| 1331 | | 1 | | | 1 | | | | 1 | 1 | 1 | | 1 | 6 |
| 1332 | | 1 | | 1 | | | | | 1 | 1 | | 1 | 1 | 6 |
| 1333 | | 1 | | | | | | | | | | | | 1 |
| 1334 | | 1 | 1 | | | | | | | | | | | 2 |
| 1335 | | 1 | 1 | | 1 | | | | | | 1 | | | 4 |
| 1336 | | 1 | 1 | 1 | 1 | | | | 1 | 1 | 1 | | 1 | 8 |
| 1337 | | 1 | | | | | | | | | | | | 1 |
| 1338 | | 1 | | 1 | 1 | | | | | | 1 | | 1 | 5 |
| 1339 | | 1 | 1 | | | | | | 1 | | | | | 3 |
| 1340 | | 1 | 1 | | 1 | | | | 1 | | 1 | 1 | 1 | 7 |
| 1341 | | 1 | | | | | | | 1 | 1 | 1 | | | 4 |
| 1342 | | 1 | 1 | 1 | | | | | | | | | | 3 |
| 1343 | | 1 | | 1 | 1 | | | | 1 | 1 | 1 | 1 | | 7 |
| 1352 | | | | 1 | | | | | | | | | | 1 |
| 1354 | | | | 1 | | | | | | | | | | 1 |
| 1355 | | | | 1 | | | | | 1 | | | | | 2 |
| 1356 | | | | 1 | | | | | | | 1 | | 1 | 3 |
| 1357 | | | | 1 | 1 | | | | | | | | | 2 |
| 1358 | | | | 1 | | | | | | | | | | 1 |
| 1359 | | | | 1 | | | | | | | | | | 1 |
| 1360 | | | | 1 | | | | | 1 | 1 | 1 | | 1 | 5 |
| 1361 | | | | 1 | | | | | | | | | | 1 |
| 1362 | | | | 1 | | | | | 1 | | 1 | 1 | 1 | 5 |
| 1363 | | | | 1 | | | | | 1 | 1 | 1 | 1 | | 5 |
| 1364 | | | | 1 | | | | | | | | | 1 | 2 |
| 1365 | | | | 1 | | | | | | | | | | 1 |
| 1366 | | | | 1 | | | | | | | | | | 1 |
| 1367 | | | | 1 | | | | | | | | | | 1 |
| 1368 | | | | 1 | 1 | | | | 1 | 1 | 1 | | 1 | 6 |
| 1369 | | | | 1 | | | | | 1 | 1 | 1 | 1 | | 5 |
| 1370 | | | | 1 | | | | | 1 | 1 | 1 | | 1 | 5 |
| 1371 | | | | 1 | | | | | | | | | | 1 |
| 1372 | | | | 1 | | | | | | | | | | 1 |
| 1373 | | | | 1 | | | | | | | | | | 1 |
| 1374 | | | | 1 | 1 | | | | | | | | | 2 |
| 1375 | | | | 1 | | | | | | | | | | 1 |
| 1376 | | | | 1 | | | | | | | | | | 1 |
| 1377 | | | | 1 | | | | | | | | | | 1 |
| 1378 | | | | 1 | 1 | | | | | | | | | 2 |
| 1379 | | | | 1 | 1 | | | | | | | | | 2 |
| 1380 | | | | 1 | | | | | | | | | | 1 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| 1381 | | | | 1 | 1 | | | | | | | | | 2 |
| 1382 | | | | 1 | | | | | | | | | | 1 |
| 1383 | | | | 1 | | | | | | | | | | 1 |
| 1384 | | | | 1 | | | | | | | | | | 1 |
| 1385 | | | | 1 | | | | | | | | | | 1 |
| 1386 | | | | 1 | | | | | | | | | | 1 |
| 1387 | | | | 1 | | | | | | | | | | 1 |
| 1388 | | | | 1 | | | | | | | | | | 1 |
| 1389 | | | | 1 | 1 | | | | | | | | | 2 |
| 1390 | | | | 1 | 1 | | | | | | | | | 2 |
| 1391 | | | | 1 | 1 | | | | | | | | | 2 |
| 1392 | | | | 1 | 1 | | | | | | | | | 2 |
| 1393 | | | | 1 | | | | | | | | | | 1 |
| 1394 | | | | 1 | | | | | | | | | | 1 |
| 1395 | | | | 1 | | | | | | | | | | 1 |
| 1396 | | | | 1 | | | | | | | | | | 1 |
| 1397 | | | | 1 | | | | | | | | | | 1 |
| 1398 | | | | 1 | 1 | | | | | | | | | 2 |
| 1399 | | | | 1 | | | | | | | | | | 1 |
| 1401 | | | 1 | | | | | | | | | | | 1 |
| 1402 | | | 1 | | | | | | | | | | | 1 |
| 1403 | | | 1 | 1 | 1 | | | | | | | | | 3 |
| 1404 | | | 1 | | | | | | | | | | | 1 |
| 1405 | | | 1 | | 1 | | | | | | | | | 2 |
| 1406 | | | 1 | | | | | | | | | | | 1 |
| 1407 | | | 1 | | | | | | | | | | | 1 |
| 1408 | | | 1 | | 1 | | | | | | | | | 2 |
| 1409 | | | 1 | | | | | | | | | | | 1 |
| 1410 | | | 1 | | | | | | | | | | | 1 |
| 1412 | | | 1 | 1 | | | | | 1 | 1 | 1 | | | 5 |
| 1413 | | | 1 | | 1 | | | | | | | | | 2 |
| 1414 | | | 1 | | 1 | | | | | | | | | 2 |
| 1415 | | | 1 | | 1 | | | | | | | | | 2 |
| 1416 | | | 1 | | | | | | | | | | | 1 |
| 1417 | | | 1 | | 1 | | | | | | | | | 2 |
| 1418 | | | 1 | | 1 | | | | | | | | | 2 |
| 1419 | | | 1 | | | | | | | | | | | 1 |
| 1420 | | | 1 | | | | | | | | | | | 1 |
| 1421 | | | 1 | | 1 | | | | | | | | | 2 |
| 1422 | | | 1 | 1 | | | | | | | | | | 2 |
| 1423 | | | 1 | | | | | | | | | | | 1 |
| 1424 | | | 1 | | | | | | | | | | | 1 |
| 1425 | | | 1 | | | | | | | | | | | 1 |
| 1426 | | | 1 | | 1 | | | | | | | | | 2 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| 1427 | | | 1 | | 1 | | | | | | | | | 2 |
| 1428 | | | 1 | | | | | | | | | | | 1 |
| 1429 | | | 1 | | | | | | | | | | | 1 |
| 1430 | | | 1 | | | | | | | | | | | 1 |
| 1431 | | | 1 | | | | | | | | | | | 1 |
| 1432 | | | 1 | | | | | | | | | | | 1 |
| 1433 | | | 1 | | 1 | | | | | | | | | 2 |
| 1434 | | | 1 | | | | | | | | | | | 1 |
| 1450 | | | 1 | | | | | | 1 | 1 | 1 | 1 | | 5 |
| 1451 | | | 1 | 1 | | | | | 1 | 1 | | 1 | 1 | 6 |
| 1452 | | | 1 | | 1 | | | | | | | | | 2 |
| 1453 | | | 1 | | 1 | | | | 1 | | | | | 3 |
| 1455 | | | 1 | 1 | | | | | | | | 1 | | 3 |
| 1456 | | | 1 | 1 | | | | | | | | | | 2 |
| 1457 | | | 1 | | 1 | | | | | 1 | | | | 3 |
| 1458 | | | 1 | 2 | 1 | | | | 1 | | 1 | 1 | | 7 |
| 1459 | | | 1 | | | | | | | | | | 1 | 2 |
| 1460 | | | 1 | 1 | | | | | | | | 1 | | 3 |
| 1461 | | | 1 | | | | | | | | 1 | 1 | 1 | 4 |
| 1462 | | | 1 | | | | | | | | | | | 1 |
| 1463 | | | 1 | | | | | | | | | | | 1 |
| 1464 | | | 1 | | | | | | | | | | | 1 |
| 1465 | | | 1 | | | | | | | | | | | 1 |
| 1466 | | | 1 | | | | | | | | 1 | | | 2 |
| 1467 | | | 1 | | 1 | | | | 1 | 1 | | | | 4 |
| 1468 | | | 1 | 1 | | | | | 1 | | 1 | 1 | | 5 |
| 1469 | | | 1 | | | | | | | | | | | 1 |
| 1470 | | | 1 | 1 | 1 | | | | 1 | 1 | | 1 | | 6 |
| 1471 | | | 1 | 1 | | | | | | 1 | | 1 | 1 | 5 |
| 1472 | | | 1 | | 1 | | | | | | | | | 2 |
| 1473 | | | 1 | | 1 | | | | 1 | 1 | | 1 | | 5 |
| 1474 | | | 1 | | 1 | | | | | 1 | | | | 3 |
| 1475 | | | 1 | 1 | | | | | 1 | 1 | | | | 4 |
| 1476 | | | 1 | | 1 | | | | | | | 1 | | 3 |
| 1477 | | | 1 | 1 | 1 | | | | 1 | | | 1 | 1 | 6 |
| 1478 | | | | 1 | | | | | | | | | | 1 |
| 1479 | | | | 1 | | | | | | | | | | 1 |
| 1480 | | | | 1 | | | | | | | | | | 1 |
| 1481 | | | | 1 | | | | | | | | | | 1 |
| 1482 | | | | 1 | | | | | | | | | | 1 |
| 1483 | | | | 1 | | | | | | | | | | 1 |
| 1484 | | | | 1 | | | | | | | | | | 1 |
| 1485 | | | | 1 | | | | | | | | | | 1 |
| 1486 | | | | 1 | | | | | | | | | | 1 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| 1487 | | | | 1 | | | | | | | | | | 1 |
| 1488 | | | | 1 | | | | | | | | | | 1 |
| 1489 | | | | 1 | | | | | | | | | | 1 |
| 1490 | | | | 1 | | | | | | | | | | 1 |
| 1491 | | | | 1 | | | | | | | | | | 1 |
| 1492 | | | | 1 | | | | | | | | | | 1 |
| 1493 | | | | 1 | | | | | | | | | | 1 |
| 1494 | | | | 1 | | | | | | | | | | 1 |
| 1495 | | | | 1 | 1 | | | | | | | | | 2 |
| 1496 | | | | 1 | | | | | | | | | | 1 |
| 1497 | | | | 1 | | | | | | | | | | 1 |
| 1498 | | | | 1 | | | | | | | | | | 1 |
| 1499 | | | | 1 | | | | | | | | | | 1 |
| 1500 | | | | 1 | | | | | | | | | | 1 |
| 1501 | | | | 1 | | | | | | | | | | 1 |
| 1502 | | | | 1 | 1 | | | | | | | | | 2 |
| 1503 | | | | 1 | | | | | | | | | | 1 |
| 1504 | | | | 1 | | | | | | | | | | 1 |
| 1505 | | | | 1 | 1 | | | | | | | | | 2 |
| 1506 | | | | 1 | | | | | | | | | | 1 |
| 1507 | | | | 1 | 1 | | | | | | | | | 2 |
| 1508 | | | | 1 | | | | | | | | | | 1 |
| 1509 | | | | 1 | | | | | | | | | | 1 |
| 1510 | | | | 1 | 1 | | | | | | | | | 2 |
| 1511 | | | | 1 | | | | | | | | | | 1 |
| 1512 | | | | 1 | 1 | | | | | | | | | 2 |
| 1513 | | | | 1 | 1 | | | | | | | | | 2 |
| 1514 | | | | 1 | | | | | | | | | | 1 |
| 1515 | | | | 1 | | | | | | | | | | 1 |
| 1516 | | | | 1 | | | | | | | | | | 1 |
| 1517 | | | | 1 | | | | | | | | | | 1 |
| 1518 | | | | 1 | | | | | | | | | | 1 |
| 1519 | | | | 1 | | | | | | | | | | 1 |
| 1520 | | | | 1 | 1 | | | | | | | | | 2 |
| 1521 | | | | 1 | | | | | | | | | | 1 |
| 1522 | | | | 1 | 1 | | | | | | | | | 2 |
| 1523 | | | | 1 | | | | | | | | | | 1 |
| 1524 | | | | | 1 | | | | | | | | | 1 |
| 1525 | | | | | 1 | | | | | | | | | 1 |
| 1527 | | | | | 1 | | | | | | | | | 1 |
| 1528 | | | | | 1 | | | | | | | | | 1 |
| 1529 | | | | | 1 | | | | | | | | | 1 |
| 1530 | | | | | 1 | | | | | | | | | 1 |
| 1531 | | | | | 1 | | | | | | | | | 1 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| 1532 | | | | | 1 | | | | | | | | | 1 |
| 1533 | | | | | 1 | | | | | | | | 1 | 2 |
| 1534 | | | | | 1 | | | | | | | | | 1 |
| 1535 | | | | | 1 | | | | | | | | | 1 |
| 1536 | | | | | 1 | | | | | | | | | 1 |
| 1537 | | | | | 1 | | | | | | | | | 1 |
| 1538 | | | | | 1 | | | | | | | | | 1 |
| 1539 | | | | | 1 | | | | | | | | | 1 |
| 1540 | | | | | 1 | | | | | | | | | 1 |
| 1541 | | | | | 1 | | | | | | | | | 1 |
| 1542 | | | | | 1 | | | | | | | | | 1 |
| 1543 | | | | | 1 | | | | | | | | | 1 |
| 1544 | | | | | 1 | | | | | | | | | 1 |
| 1545 | | | | | 1 | | | | | | | | | 1 |
| 1546 | | | | | 1 | | | | | | | | | 1 |
| 1547 | | | | | 1 | | | | | | | | | 1 |
| 1548 | | | | | 1 | | | | | | | | | 1 |
| 1549 | | | | | 1 | | | | | | | | | 1 |
| 1550 | | | | | 1 | | | | | | | | | 1 |
| 1551 | | | | | 1 | | | | | | | | | 1 |
| 1552 | | | | | 1 | | | | | | | | | 1 |
| 1553 | | | | | 1 | | | | | | | | | 1 |
| 1554 | | | | | 1 | | | | | | | | | 1 |
| 1555 | | | | | 1 | | | | | | | | | 1 |
| 1556 | | | | | 1 | | | | | | | | | 1 |
| 1557 | | | | | 1 | | | | | | | | | 1 |
| 1558 | | | | | 1 | | | | | | | | | 1 |
| 1559 | | | | | 1 | | | | | | | | | 1 |
| 1560 | | | | | 1 | | | | | | | | | 1 |
| 1561 | | | | | 1 | | | | | | | | | 1 |
| 1562 | | | | | 1 | | | | | | | | | 1 |
| 1563 | | | | | 1 | | | | | | | | | 1 |
| 1606 | | | | | 1 | | | | | | 1 | | 1 | 3 |
| 1607 | | | | | 1 | | | | 1 | 1 | 1 | | 1 | 5 |
| 1609 | | | | | | | | | 1 | | | | | 1 |
| 1610 | | | | | 1 | | | | 1 | | | | | 2 |
| 1611 | | | | | 1 | | | | | | | | | 1 |
| 1612 | | | | | | | | | | | | | 1 | 1 |
| 1613 | | | | | 1 | | | | 1 | | | 1 | | 3 |
| 1614 | | | | | 1 | | | | 1 | 1 | | 1 | | 4 |
| 1615 | | | | | 1 | | | | | | 1 | 1 | 1 | 4 |
| 1651 | | | | | | | | | 1 | 1 | | 1 | 1 | 4 |
| 1652 | | | | | | | | | 1 | 1 | 1 | 1 | | 4 |
| 1653 | | | | | | | | | 1 | 1 | | | | 2 |

| Tag # Julian date | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| 1654 | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 5 |
| 1655 | | | | | | | | | 1 | | 1 | 1 | | 3 |
| 1656 | | | | | | | | | 1 | | | | | 1 |
| 1657 | | | | | | | | | 1 | | 1 | 1 | | 3 |
| 1658 | | | | | | | | | 1 | 1 | | 1 | | 3 |
| 1659 | | | | | | | | | 1 | | 1 | | | 2 |
| 1671 | | | | | | | | | | 1 | | | | 1 |
| 1672 | | | | | | | | | | 1 | | | | 1 |
| 1673 | | | | | | | | | | 1 | | | | 1 |
| 1674 | | | | | | | | | | 1 | | | | 1 |
| 1701 | | | | | | | | | 1 | | | | | 1 |
| 1702 | | | | | | | | | 1 | | | | | 1 |
| 1703 | | | | | | | | | 1 | | | | | 1 |
| 1704 | | | | | | | | | 1 | | | | | 1 |
| 1705 | | | | | | | | | 1 | | | | | 1 |
| 1706 | | | | | | | | | 1 | 1 | 1 | | 1 | 4 |
| 1707 | | | | | | | | | 1 | | | | | 1 |
| 1708 | | | | | | | | | 1 | | | | | 1 |
| 1709 | | | | | | | | | 1 | | | | | 1 |
| 1710 | | | | | | | | | 1 | | | | | 1 |
| 1711 | | | | | | | | | 1 | | | | | 1 |
| 1712 | | | | | | | | | 1 | | | | | 1 |
| 1713 | | | | | | | | | 1 | | | | | 1 |
| 1714 | | | | | | | | | 1 | 1 | | | | 2 |
| 1715 | | | | | | | | | 1 | | | | | 1 |
| 1716 | | | | | | | | | 1 | 1 | | | | 2 |
| 1717 | | | | | | | | | 1 | | | | | 1 |
| 1718 | | | | | | | | | 1 | | | | | 1 |
| 1719 | | | | | | | | | 1 | | 1 | 1 | 1 | 4 |
| 1720 | | | | | | | | | 1 | | | | | 1 |
| 1721 | | | | | | | | | 1 | 1 | 1 | 1 | | 4 |
| 1722 | | | | | | | | | 1 | | | | | 1 |
| 1723 | | | | | | | | | 1 | | | | | 1 |
| 1724 | | | | | | | | | 1 | | | | | 1 |
| 1725 | | | | | | | | | 1 | | | | | 1 |
| 1726 | | | | | | | | | 1 | | | | | 1 |
| 1727 | | | | | | | | | 1 | | | | | 1 |
| 1728 | | | | | | | | | 1 | | | | | 1 |
| 1729 | | | | | | | | | 1 | 1 | | 1 | | 3 |
| 1730 | | | | | | | | | 1 | 1 | 1 | 1 | | 4 |
| 1731 | | | | | | | | | 1 | | | | | 1 |
| 1732 | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 5 |
| 1733 | | | | | | | | | 1 | | | | | 1 |
| 1734 | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 5 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| 1735 | | | | | | | | | 1 | | 1 | | | 2 |
| 1736 | | | | | | | | | 1 | 1 | 1 | 1 | 1 | 5 |
| 1737 | | | | | | | | | 1 | | | | | 1 |
| 1738 | | | | | | | | | 1 | | | | | 1 |
| 1739 | | | | | | | | | 1 | | | | | 1 |
| 1740 | | | | | | | | | 1 | | 1 | 1 | | 3 |
| 1741 | | | | | | | | | 1 | 1 | 1 | | | 3 |
| 1742 | | | | | | | | | 1 | | | | | 1 |
| 1743 | | | | | | | | | 1 | 1 | 1 | | 1 | 4 |
| 1744 | | | | | | | | | 1 | | | | | 1 |
| 1745 | | | | | | | | | 1 | | | | | 1 |
| 1746 | | | | | | | | | 1 | | 1 | 1 | | 3 |
| 1747 | | | | | | | | | | 1 | | | | 1 |
| 1748 | | | | | | | | | | 1 | | | | 1 |
| 1749 | | | | | | | | | | 1 | | | | 1 |
| 1750 | | | | | | | | | | 1 | 1 | | | 2 |
| 1751 | | | | | | | | | | 1 | | | | 1 |
| 1752 | | | | | | | | | | 1 | | | | 1 |
| 1753 | | | | | | | | | | 1 | | | | 1 |
| 1754 | | | | | | | | | | 1 | | | | 1 |
| 1755 | | | | | | | | | | 1 | | | | 1 |
| 1756 | | | | | | | | | | 1 | 1 | 1 | 1 | 4 |
| 1757 | | | | | | | | | | 1 | | | | 1 |
| 1776 | | | | | | | | | | 1 | 1 | | 1 | 3 |
| 1777 | | | | | | | | | | 1 | 1 | 1 | 1 | 4 |
| 1778 | | | | | | | | | | 1 | | | | 1 |
| 1779 | | | | | | | | | | 1 | 1 | 1 | | 3 |
| 1780 | | | | | | | | | | 1 | | | | 1 |
| 1781 | | | | | | | | | | 1 | | | | 1 |
| 1782 | | | | | | | | | | 1 | | | | 1 |
| 1783 | | | | | | | | | | 1 | | | | 1 |
| 1796 | | | | | | | | | | | 1 | | | 1 |
| 1797 | | | | | | | | | | | 1 | 1 | | 2 |
| 1798 | | | | | | | | | | | 1 | | | 1 |
| 1799 | | | | | | | | | | | 1 | 1 | | 2 |
| 1800 | | | | | | | | | | | 1 | 1 | 1 | 3 |
| 1801 | | | | | | | | | | | 1 | 1 | 1 | 3 |
| 1802 | | | | | | | | | | | 1 | | | 1 |
| 1803 | | | | | | | | | | | 1 | 1 | | 2 |
| 1804 | | | | | | | | | | | 1 | 1 | 1 | 3 |
| 1805 | | | | | | | | | | | 1 | 1 | | 2 |
| 1807 | | | | | | | | | | | 1 | 1 | | 2 |
| 1808 | | | | | | | | | | | 1 | | 1 | 2 |
| 1809 | | | | | | | | | | | 1 | | | 1 |

| Tag # / Julian date | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| 1811 | | | | | | | | | | | 1 | | 1 | 2 |
| 1813 | | | | | | | | | | | 1 | | | 1 |
| 1814 | | | | | | | | | | | 1 | | | 1 |
| 1815 | | | | | | | | | | | 1 | | 1 | 2 |
| 1816 | | | | | | | | | | | 1 | | | 1 |
| 1834 | | | | | | | | | | | | 1 | | 1 |
| 1835 | | | | | | | | | | | | 1 | 1 | 2 |
| 1836 | | | | | | | | | | | | 1 | | 1 |
| 1837 | | | | | | | | | | | | 1 | 1 | 2 |
| 1838 | | | | | | | | | | | | 1 | | 1 |
| 1839 | | | | | | | | | | | | 1 | | 1 |
| 1840 | | | | | | | | | | | | 1 | 1 | 2 |
| 1841 | | | | | | | | | | | | 2 | | 2 |
| 1847 | | | | | | | | | | | | 1 | | 1 |
| 1848 | | | | | | | | | | | | 1 | 1 | 2 |
| 1849 | | | | | | | | | | | | 1 | | 1 |
| 1850 | | | | | | | | | | | | 1 | | 1 |
| 1851 | | | | | | | | | | | | 1 | | 1 |
| 1852 | | | | | | | | | | | | 1 | | 1 |
| 1853 | | | | | | | | | | | | 1 | 1 | 2 |
| 1854 | | | | | | | | | | | | 1 | 1 | 2 |
| 1855 | | | | | | | | | | | | 1 | 1 | 2 |
| 1875 | | | | | | | | | | | | 1 | | 1 |
| 1879 | | | | | | | | | | | | | 1 | 1 |
| 1880 | | | | | | | | | | | | | 1 | 1 |
| 1881 | | | | | | | | | | | | | 1 | 1 |
| 1411/1182 | | 1 | 1 | | 1 | | | | | | | | | 3 |
| 1454/1320 | | 1 | 1 | 1 | 1 | | | | | | | | | 4 |
| 1526/1239 | | 1 | 1 | | 1 | | | | | | | | | 3 |
| 1670/1608 | | | | | 1 | | | | | 1 | | 1 | | 3 |
| 1812/1353 | | | | 1 | | | | | 1 | 1 | 1 | | 1 | 5 |
| A | | | | | | | | | | | | | 3 | 3 |
| B | | | | | | | | | | | | | 3 | 3 |
| C | | | | | | | | | | | | | 3 | 3 |
| D | | | | | | | | | | | | | 3 | 3 |
| E | | | | | | | | | | | | | 2 | 2 |
| F | | | | | | | | | | | | | 2 | 2 |
| G | | | | | | | | | | | | | 2 | 2 |
| H | | | | | | | | | | | | | 2 | 2 |
| I | | | | | | | | | | | | | 2 | 2 |
| J | | | | | | | | | | | | | 2 | 2 |
| K | | | | | | | | | | | | | 2 | 2 |
| L | | | | | | | | | | | | | 2 | 2 |
| M | | | | | | | | | | | | | 2 | 2 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| **N** | | | | | | | | | | | | | 1 | 1 |
| **O** | | | | | | | | | | | | | 1 | 1 |
| **P** | | | | | | | | | | | | | 1 | 1 |
| **(blank)** | | | | | | | | | | | | | | |
| **781** | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | 1 | 10 |
| **762** | 1 | | 1 | 1 | 1 | | 1 | | | | | 1 | | 6 |
| **785** | 1 | 1 | | 1 | | 1 | | | | 1 | | 1 | | 6 |
| **1061** | 1 | | | | | | | 1 | | | | | | 2 |
| **765** | 1 | 1 | 1 | | 1 | | | | | | 1 | | | 5 |
| **1062** | 1 | | | 1 | | | | 1 | | | | | | 3 |
| **1063** | 1 | 1 | | 1 | | | 1 | | 1 | | | | | 5 |
| **1661/764** | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | 1 | | | | 8 |
| **1064** | 1 | | | 1 | 1 | 1 | 1 | | | | 1 | 1 | 1 | 8 |
| **1065** | 1 | | | | 1 | 1 | | | | | | | | 3 |
| **1045** | 1 | | | 1 | | | | | | | | 1 | | 3 |
| **1066** | 1 | 1 | | | | | | | | | | | 1 | 3 |
| **811** | 1 | 1 | | | | | | | | | | | | 2 |
| **1067** | 1 | 1 | | | | | | | | | | | | 2 |
| **793** | 1 | | | | | | | | | | | | | 1 |
| **1068** | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | 9 |
| **815** | 1 | | 1 | | | | | | | | | | | 2 |
| **768** | 1 | | | | | | | | | | | | | 1 |
| **1069** | 1 | | | | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 8 |
| **798** | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | 7 |
| **1070** | 1 | 1 | | | | | 1 | 1 | 1 | | | | 1 | 6 |
| **820** | 1 | | | 1 | 1 | 1 | | | 1 | | 1 | 1 | | 7 |
| **1859/875** | 1 | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 10 |
| **876** | 1 | | | 1 | | | | | | | | | | 2 |
| **1071** | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | 1 | | | | 8 |
| **817** | 1 | 1 | 1 | | | 1 | | | 1 | 1 | | | | 6 |
| **1072** | 1 | | | | | | | | 1 | | 1 | | 1 | 4 |
| **1019** | 1 | | 1 | 1 | | 1 | 1 | | 1 | | 1 | | | 7 |
| **773** | 1 | 1 | | | | 1 | 1 | | | | | | | 4 |
| **803** | 1 | 1 | 1 | | 1 | | 1 | 1 | | 1 | 1 | | | 8 |
| **823** | 1 | | | | 1 | | 1 | 1 | 1 | 1 | 1 | | 1 | 8 |
| **778** | 1 | 1 | 1 | | 1 | | | | | | | | | 4 |
| **1618/805** | 1 | | 1 | 1 | 1 | 1 | | | | | | | | 5 |
| **806** | 1 | 1 | 1 | | 1 | | | | | | | | | 4 |
| **1073** | 1 | 1 | | | 1 | | 1 | 1 | 1 | 1 | 1 | | 1 | 9 |
| **1074** | 1 | 1 | | | | | | | | | | | | 2 |
| **1076** | 1 | | 1 | | | | | 1 | | 1 | 1 | 1 | | 6 |
| **1077** | 1 | 1 | | 1 | 1 | 1 | | | | | | | | 5 |
| **1078 / 1646** | 1 | | | | | | | | 1 | 1 | 1 | | | 4 |
| **1079** | 1 | 1 | 1 | | | | | | | | | | | 3 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| **1080 / 1619** | 1 | 1 | | | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| **1081** | 1 | 1 | | 1 | 1 | | | 1 | | | 1 | 1 | | 7 |
| **1082 / 1641** | 1 | | | 1 | | 1 | | | 1 | | | | | 4 |
| **767** | | 1 | | | | | | | | | | | | 1 |
| **1305** | | 1 | 1 | 1 | | | | | | | | | | 3 |
| **809** | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | | | 9 |
| **791** | | 1 | | 1 | | | | 1 | | | | | | 3 |
| **810** | | 1 | | 1 | 1 | | 1 | 1 | 1 | | 1 | 1 | | 8 |
| **1046** | | 1 | 1 | 1 | | | 1 | | 1 | | | | | 5 |
| **872** | | 1 | | | | | | | 1 | | | | | 2 |
| **1075** | | 1 | 1 | | 1 | | | | | | 1 | | | 4 |
| **1044** | | 1 | 1 | | | 1 | | 1 | | 1 | | 1 | | 6 |
| **792** | | 1 | 1 | | | | | | | | | | | 2 |
| **613** | | 1 | | | | | | | | | | | | 1 |
| **1017** | | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 10 |
| **1049** | | 1 | | 1 | | 1 | 1 | | | 1 | | | 1 | 6 |
| **1018** | | 1 | 1 | | | | | | | | | | | 2 |
| **1306 / 1438** | | 1 | 1 | 1 | 1 | 1 | | | 1 | | | | 1 | 7 |
| **799** | | 1 | 1 | | 1 | 1 | | 1 | | 1 | | 1 | | 7 |
| **821** | | 1 | | | 1 | | | | | | | | | 2 |
| **874 / 1307** | | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | 6 |
| **1308 / 1444** | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | | | 1 | 8 |
| **801** | | 1 | 1 | | | | | | | | | | | 2 |
| **1309** | | 1 | | 1 | | | 1 | | | | | | | 3 |
| **804 / 1629** | | 1 | 1 | | 1 | | | 1 | 1 | 1 | 1 | 1 | 1 | 9 |
| **885** | | 1 | | | | | 1 | | | | | | | 2 |
| **1310** | | 1 | | 1 | | 1 | | | | 1 | 1 | 1 | 1 | 7 |
| **1312** | | 1 | | | 1 | | | | | | | | | 2 |
| **1313** | | 1 | | 1 | | 1 | 1 | | 1 | | | 1 | | 6 |
| **1314** | | 1 | 1 | | 1 | | 1 | 1 | | 1 | 1 | | | 7 |
| **1435 / 1345** | | | 1 | 1 | 1 | | | 1 | | | 1 | | | 5 |
| **1882/784** | | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | | 1 | 8 |
| **1436** | | | 1 | | | | 1 | | | 1 | | 1 | 1 | 5 |
| **1437** | | | 1 | | | | | 1 | | 1 | | 1 | | 4 |
| **790** | | | 1 | | | | | 1 | | | | | | 2 |
| **763** | | | 1 | | | | | | | | | | | 1 |
| **812** | | | 1 | 1 | | | | | | | | | | 2 |
| **1439** | | | 1 | | | | | | 1 | | | | 1 | 3 |
| **1440** | | | 1 | | | | | | | | | | | 1 |
| **1441** | | | 1 | 1 | 1 | | | | 1 | 1 | | | | 5 |
| **772** | | | 1 | | | | | | | | | | | 1 |
| **1442 / 1628** | | | 1 | | | | 1 | 1 | | | 1 | 1 | | 5 |
| **1443** | | | 1 | | | | | 1 | 1 | | | | 1 | 4 |
| **881** | | | 1 | 1 | 1 | | 1 | | 1 | 1 | | | | 6 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| 884 | | | 1 | | | | | | | | | | 1 | 2 |
| 1445 | | | 1 | | 1 | | 1 | | | | | | | 3 |
| 1446 | | | 1 | | | 1 | | 1 | 1 | | | | | 4 |
| 1447 | | | 1 | | | | | | | 1 | | | | 2 |
| 1448 | | | 1 | | | 1 | | 1 | | 1 | | | | 4 |
| 1449 | | | 1 | | | | 1 | | 1 | | | | | 3 |
| 1344 | | | | 1 | | | | 1 | | 1 | 1 | | 1 | 5 |
| 787 | | | | 1 | | | | | 1 | | | | | 2 |
| 1058 | | | | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | | 7 |
| 2040/1346 | | | | 1 | | | | | | | 1 | 1 | | 3 |
| 777 | | | | 1 | | 1 | | | | | | | | 2 |
| 1347 | | | | 1 | | 1 | | | | | | | | 2 |
| 1348 | | | | 1 | 1 | 1 | | | | | 1 | | | 4 |
| 1349 | | | | 1 | | | | | 1 | | | 1 | | 3 |
| 1350 | | | | 1 | | 1 | | | | | | 1 | | 3 |
| 1351 / 1603 | | | | 1 | 1 | | 1 | | | 1 | | 1 | | 5 |
| 760 | | | | | 1 | | 1 | 1 | 1 | | | | 1 | 5 |
| 1400 | | | | | 1 | | | | | | | | 1 | 2 |
| 1601 | | | | | 1 | 1 | | | | | | | | 2 |
| 1602 | | | | | 1 | | | | 1 | | | 1 | 1 | 4 |
| 808 / 1632 | | | | | 1 | | | | 1 | | 1 | | 1 | 4 |
| 1604 | | | | | 1 | | 1 | | 1 | 1 | | 1 | | 5 |
| 1605 | | | | | 1 | | 1 | | | | 1 | | | 3 |
| 780 | | | | | | 1 | | | | | | | | 1 |
| 437 | | | | | | 1 | | | | | | | | 1 |
| 1616 | | | | | | 1 | | | 1 | | | 1 | | 3 |
| 1617 | | | | | | 1 | | 1 | | | | | | 2 |
| 1016 | | | | | | 1 | | | | | | | | 1 |
| 1037 | | | | | | 1 | | | | | | | | 1 |
| 1020 | | | | | | 1 | 1 | | 1 | | 1 | | | 4 |
| 2080/1620 | | | | | | 1 | | | | | | 1 | 1 | 3 |
| 1043 | | | | | | | 1 | | | | | | | 1 |
| BLUE | | | | | | | 1 | | | | | | | 1 |
| BLUE1 | | | | | | | 1 | | | | | | | 1 |
| BLUE2 | | | | | | | 1 | | | | | | | 1 |
| BLUE3 | | | | | | | 1 | | | | | | | 1 |
| BLUE4 | | | | | | | 1 | | | | | | | 1 |
| 878 | | | | | | | 1 | | | | | 1 | | 2 |
| 1618 | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| BLUE5 | | | | | | | 1 | | | | | | | 1 |
| BLUE6 | | | | | | | 1 | | | | | | | 1 |
| 1621 | | | | | | | | 1 | | | | 1 | | 2 |
| 1622 | | | | | | | | 1 | | | | | | 1 |
| 1623 | | | | | | | | 1 | | 1 | 1 | | | 3 |

| Tag # | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Julian date | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | Total |
| 871 | | | | | | | | 1 | | 1 | 1 | | 1 | 4 |
| 1624 | | | | | | | | 1 | | 1 | | 1 | | 3 |
| 1625 | | | | | | | | 1 | | | | | | 1 |
| 1626 | | | | | | | | 1 | | | 1 | 1 | | 3 |
| 1627 / 1663 | | | | | | | | 1 | | 1 | 1 | | 1 | 4 |
| 1630 | | | | | | | | 1 | | 1 | | | | 2 |
| 1631 | | | | | | | | 1 | | | | | 1 | 2 |
| 1633 | | | | | | | | | 1 | | | | | 1 |
| 1634 | | | | | | | | | 1 | | | | | 1 |
| 1635 | | | | | | | | | 1 | | | 1 | | 2 |
| 1636 | | | | | | | | | 1 | | | | | 1 |
| 1825 / 1637 | | | | | | | | | 1 | | 1 | | 1 | 3 |
| 1638 | | | | | | | | | 1 | | | 1 | 1 | 3 |
| 1639 | | | | | | | | | 1 | | | | | 1 |
| 818 / 1640 | | | | | | | | | 1 | | 1 | | | 2 |
| 807 | | | | | | | | | 1 | | | 1 | | 2 |
| 1642 | | | | | | | | | 1 | | | | | 1 |
| 1643 | | | | | | | | | 1 | | 1 | | | 2 |
| 1644 | | | | | | | | | 1 | | | | | 1 |
| 1645 | | | | | | | | | 1 | | | 1 | | 2 |
| 776 | | | | | | | | | 1 | | | | | 1 |
| 1647 | | | | | | | | | 1 | | | | 1 | 2 |
| 1648 | | | | | | | | | 1 | | | | 1 | 2 |
| 797 | | | | | | | | | 1 | | | | | 1 |
| 1649 | | | | | | | | | 1 | | 1 | 1 | | 3 |
| 1650 | | | | | | | | | 1 | 1 | 1 | | | 3 |
| 786 | | | | | | | | | | 1 | | | | 1 |
| 1660 | | | | | | | | | | 1 | | | | 1 |
| 1662 | | | | | | | | | | 1 | | | | 1 |
| 1664 | | | | | | | | | | 1 | | | | 1 |
| 1665 | | | | | | | | | | 1 | 1 | | | 2 |
| 1666 | | | | | | | | | | 1 | | | | 1 |
| 1773 | | | | | | | | | | 1 | | | | 1 |
| 825 | | | | | | | | | | 1 | | | | 1 |
| 1667 | | | | | | | | | | 1 | | | | 1 |
| 1668 | | | | | | | | | | 1 | 1 | | | 2 |
| 1669 | | | | | | | | | | 1 | | | | 1 |
| 1817 | | | | | | | | | | | 1 | | | 1 |
| 782 | | | | | | | | | | | 1 | | | 1 |
| 1818 | | | | | | | | | | | 1 | 1 | | 2 |
| 1661 | | | | | | | | | | | 1 | | | 1 |
| 1824 | | | | | | | | | | | 1 | | | 1 |
| 813 | | | | | | | | | | | 1 | 1 | | 2 |
| 1823 / 2284 | | | | | | | | | | | 1 | | 1 | 2 |

| Tag # / Julian date | Pre baiting | | | | | Baiting | | | Post baiting | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | 122 | |
| **1822** | | | | | | | | | | | 1 | | | 1 |
| **1821** | | | | | | | | | | | 1 | | | 1 |
| **1820** | | | | | | | | | | | 1 | | | 1 |
| **1856 / 1883** | | | | | | | | | | | | 1 | 1 | 2 |
| **1060** | | | | | | | | | | | | 1 | | 1 |
| **1857** | | | | | | | | | | | | 1 | 1 | 2 |
| **1858 / 1885** | | | | | | | | | | | | 1 | 1 | 2 |
| **796** | | | | | | | | | | | | 1 | | 1 |
| **1860 / 2039** | | | | | | | | | | | | 1 | 1 | 2 |
| **1861** | | | | | | | | | | | | 1 | 1 | 2 |
| **1862 / 2010** | | | | | | | | | | | | 1 | | 1 |
| **1863** | | | | | | | | | | | | 1 | | 1 |
| **1864** | | | | | | | | | | | | 1 | 1 | 2 |
| **1865** | | | | | | | | | | | | 1 | | 1 |
| **1866** | | | | | | | | | | | | 1 | 1 | 2 |
| **1884** | | | | | | | | | | | | | 1 | 1 |
| **1886** | | | | | | | | | | | | | 1 | 1 |
| **1806** | | | | | | | | | | | 1 | | | 1 |
| **Grand Total** | **129** | **193** | **213** | **223** | **228** | **42** | **48** | **48** | **157** | **131** | **132** | **129** | **137** | **1810** |