

# Early detection of mouse plagues

## Dr Glen Saunders

Research Leader Vertebrate Pests, Health Science, Strategic Alliances & Evaluation, Orange

### Introduction

Because of the mouse's high potential rate of population increase, early detection of mouse plagues is essential for effective control to be implemented.

Early detection of a plague can be difficult due to:

- normal seasonal peaks which cause minimal impact on production;
- lack of knowledge on interpreting the various methods of monitoring population changes, such as census cards;
- failure to recognise and report unusual population changes.

Landholders need to acknowledge these difficulties so that they can monitor for mouse plagues each year. Persistence in maintaining an accurate monitoring process will have its rewards.

Quite often the rapid increase phase of mouse populations is not fully recognised until numbers have started to approach plague proportions. At this point damage has already become serious and averting further damage to crops is made extremely difficult because of the size and distribution of the mouse population.

Theoretically, plagues can be predicted using rainfall patterns and vegetation response. However, predictions are not always correct, particularly on a local scale.

In recent decades, mouse plagues have occurred as isolated outbreaks, rather than as a widespread problem which once would have affected nearly all grain growing areas in south-eastern Australia.

For this reason it is increasingly important for landholders to be vigilant in monitoring their own crops.

### Normal fluctuations in mouse numbers

Mice are present in nearly all grain growing areas of Australia throughout the year. Mouse numbers depend on many factors but the most important is the difference between non-breeding winter populations and breeding populations of spring and summer. Mice are not long lived and the size of the over-wintering population is usually small and unnoticeable.

The trigger for commencement of breeding, which is not yet fully understood, and the prevailing factors of weather and food supply determine whether a population develops into a plague.

Breeding usually starts around October and continues through to the following May but occasionally some females (10–20%) breed through winter or breeding starts before October or finishes earlier than May. Knowledge of these changes in breeding performance and the size of the over-wintering population are important factors to assess when predicting the likelihood of a plague. Peak numbers can be expected by early autumn with numbers then declining due to lack of food and to stress-related diseases.

Winter conditions can also cause mice to invade homes, becoming more noticeable to the public. This should not be confused with plague conditions.

Mice can breed at an alarming rate, with litters of 2–11 every three weeks. If conditions are right, plague proportions can be reached after only 4–5 generations.

Mice will generally not move far when the food supply is adequate. However, they will invade new crops or habitats in search of food or as a result of increasing population pressure. In these situations mice can move long distances.

### Identifying the problem

Personal observations are still the most reliable method of identifying increasing mouse numbers. The points below are some of the signs to watch for.



### **Signs of mouse activity around the perimeter of crops**

Burrows, soil removed from within burrows and worn tracks are often visible. The intensity of burrowing indicates the number of mice present. In irrigation areas, mouse activity is most obvious around channel banks early in the maturation of the crop. After the crop has matured or when water is taken off, mouse tracks are usually visible in the wet soil.

### **Signs of crop damage**

Mice have been known to dig freshly sown seeds out of the ground before they germinate. The digging is funnel shaped and the husk of the seed is usually nearby. Mice may damage immature crops by gnawing stems just above the nodes causing the heads of the plants to die off and become visible as brown patches in a green crop. In more mature crops, damaged heads tend to stand higher due to the removal of the grain. Other signs include mounds of gnawed grain at points within the crop, particularly around burrow entrances.

It is necessary to walk through the crop to identify these signs. Grain damage to some crops, such as sunflower, can be differentiated from the damage caused by birds as birds tend to remove the entire seed from the head whereas mice gnaw at the seed while it is still attached.

### **Sightings**

Increasing mouse activity is quite often revealed along the roadside, particularly near crops, at night by car headlights. If mouse damage is suspected, a quick inspection of a crop at night with a torch can also reveal mouse activity.

### **Presence of nests**

In irrigated crops, particularly rice, nests are often visible, appearing as leaf and stem platforms at water level. This sign usually occurs once a plague has developed.

### **Droppings**

Droppings are useful in identifying the presence of mice in larger crops such as sunflower and maize. Droppings are found at the junction of leaves and stem, or on the seed head.

### **Presence of mice in storage facilities**

Mice are usually present all year in facilities such as grain storage silos. Any unusual increase in numbers or damage can indicate an increase in field populations.

### **An increased number of predators working the cropping area**

The most obvious predators are the raptors (hawks, kestrels and kites). If large numbers are hovering in the crop area it may be worth investigating. However, it has been noted in previous plagues that raptors are slow to respond to increasing mouse populations and are generally not apparent until damage has become evident.

### **Monitoring mouse numbers**

If the risk of a build-up of mouse numbers is high or if early signs are evident, it is worth attempting to initiate a direct assessment of mouse numbers in the field. There are two simple ways of doing this: census cards and trapping.

#### **Census cards**

Census cards are squares of paper soaked in canola oil that are pegged to the ground at intervals throughout the survey area. If mice are present they will chew away the paper to varying degrees depending on the numbers of mice present and the availability of alternative food. Census cards are occasionally known as bait cards but they do not kill mice.

This method only suggests whether mice are present at the time: it does not indicate the likely progression of the population towards a plague. They should be put out in a variety of habitats early in the season. If cards are eaten in or around early-maturing crops this indicates potential problems. Field experience indicates that card consumption of around 20% or more in immature crops is a reasonable guide that the mouse problem is real. Cards can become less reliable as crops mature and provide greater amounts of food for the mice.

#### **Trapping**

Simple snap-back traps can be a useful means of checking a mouse population. For ease of baiting the traps, permanently attach a small piece of leather to the trigger and occasionally add a few drops of linseed (or similar) oil. Alternatively, smear some peanut butter on the trigger each time they are set. Step out straight lines of 20–25 traps, with traps 10 m apart, in a variety of habitats, for three consecutive nights.

Trap success is the number of mice caught divided by the number of traps per line times the number of nights, e.g. 30 mice from 25 traps over 4 nights =  $30/(25 \times 4) = 30\%$ .

Trap success can be used as the index of mouse abundance. It is difficult to determine what rate constitutes a risk but anything around 20% in an early-maturing crop would indicate problems.

## Breeding status

A trapped sample also allows the population to be examined for its breeding status. The earlier a population starts to breed, the more likely a plague will occur. Signs to look for are obviously pregnant females and females that have already started to breed (indicated by prominent mammary glands). Another indication of early breeding can be obtained from the size of the mice caught. Adult mice usually measure over 72 mm from the tip of the nose to the base of the tail. Mice with head/body measurements smaller than 72 mm, particularly if they are much smaller, indicate that juveniles have already been born into the population that season.

## Further information

For further information, or if you need assistance in interpreting your assessment of mouse numbers and the likelihood of an approaching plague, consult your local Agricultural Protection Officer or Rural Lands Protection Board Ranger.

---

© State of New South Wales  
through NSW Department of Primary Industries 2007

ISSN 1832-6668

Replaces Agnote DAI-135

Check for updates of this Primefact at:

[www.dpi.nsw.gov.au/primefacts](http://www.dpi.nsw.gov.au/primefacts)

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (February 2007). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

Job number 7421