

# FAQs about Mouse Plagues

## What is a mouse plague?

Plagues of house mice occur somewhere in the grain-growing regions of southern and eastern Australia on average one year in four. These plagues are characterised by concurrent widespread eruptions of mouse densities in excess of 1000 mice per hectare. As the mice aggregate around food sources during plagues, their densities can reach 3000 mice per hectare in grain stores. Mouse plagues cause significant damage to agricultural crops, but they also damage infrastructure and can lead to stress in rural communities.

## Where do mouse plagues occur?

Mouse plagues occur regularly only in the southern and eastern grain belts of Australia and one province in the north-western plateau of China. Localised mouse plagues have been recorded in California in the United States and a few other places but they are short in duration and do not occur frequently or cause significant damage as they do in Australia.

## What triggers a mouse plague?

There are a number of factors that are understood to be the triggers of mouse plagues. These factors are different for the southern (southern NSW, Victoria and South Australia) and northern (northern NSW and southeast Queensland) range of mouse plagues. In the south above average rainfall from April to October is sufficient to start a plague, but not the only trigger. The rains result in favourable conditions for mice through providing lots of good quality food. There also needs to be a minimum density of

mice to respond to these rains. The time from the plague trigger to the peak in mouse numbers can take just nine months but in some instances it takes 18 months. A crash occurs at the end of plagues, and mouse numbers will drop from more than 1000 mice per hectare to two or three mice per hectare. This rapid decline occurs over a wide area and within only a few weeks.

## Why do mouse plagues end?

The reason why mouse plagues crash is not entirely understood, but it is likely that it is a combination of several factors. These factors are disease, increased social stress (because of overcrowding), lack of food and predation pressure. The end of the plague, or "crash", generally occurs in mid to late winter. This crash usually occurs synchronously and rapidly across the area of the plague.

## Do plagues travel?

Mouse plagues do not travel. However, small-scale local movements by individual mice can occur (at the farm level). Mouse plagues do not appear overnight: they build up over a period of time (nine months or more) in response to favourable conditions, such as good rainfall. As crops mature across the grain growing region, the conditions favourable for mice also change and so it appears the mouse plague moves across the region.



## How far can a mouse move?

Mice have an ability to seek favourable food sources such as ripening crops. These movements are predominantly towards neighbouring crops and could be in any direction. During the breeding season, the mice generally live within an area of only half a tennis court (20 m x 20 m). During the non-breeding season though, mice seem to become nomadic. The distances mice move in a night can be up to a few hundred metres, perhaps one kilometre at the most.

### Can we predict plagues?

Plagues in northwest Victoria can now be predicted with some confidence. Research by CSIRO has identified the key elements of the increase in mouse numbers, and these are monitored allowing a prediction of what is likely to occur. CSIRO researchers successfully predicted the plague in the Mallee region in 1994, 15 months in advance, and correctly predicted high numbers in 2001, and low numbers in both 2002 and 2003 for the Mallee region of northwest Victoria.



### How can I minimise damage?

Control methods should be implemented early in the build-up to plague densities. Once mouse numbers reach plague densities, the only option for control is broad-scale poisoning, which is time consuming and expensive. Therefore, management should be aimed at controlling mice before they inhabit the crops and before significant crop damage occurs by conducting management activities around the perimeter of the crop.

The uncultivated edges of the crops (eg fencelines) are important habitats for mice because of their proximity to crops and because there is often good cover from weeds and grasses. Management involves cleaning along fencelines to remove weeds and seed-set by grasses. Perimeter baiting is also a possibility.

It is also important to reduce the amount of grain remaining on the ground after harvest and, if you have sheep, these can be put on the stubble to reduce the food supply for mice.

Most damage occurs at sowing of winter cereals when mouse numbers are generally highest. To reduce damage at sowing, the seeds could be planted deeper (for example 5 or 7 cm) or the crop could be cross-harrowed to disguise the drill lines.

### What poisons are available?

There are two types of rodenticides available for use on mice. These are available from rural merchants, and must be used in accordance with label instructions.

- (1) zinc phosphide which is an acute poison that can be used in broadacre situations – a mouse needs only to eat 1 grain of baited wheat, but death can take from 20 minutes to 2 hours; and
- (2) anticoagulants containing active ingredients such as warfarin, coumatetralyl, brodifacoum or bromadiolone (these can only be used in bait stations) – mice will die 5-7 days later.

### What problems do mice cause in intensive animal facilities?

Rodents in piggeries, poultry facilities, etc., are a serious problem. For example, rats (*Rattus rattus* and *R. norvegicus*) and house mice (*Mus domesticus*) are commonly found in intensive pig production facilities. Rats and mice cause significant problems to the infrastructure of piggeries and reduce pig production. The main losses are to production (reduction in growth rates and breeding performance), damage to buildings (electrical wiring, insulation), fouling of feed, the risk of diseases and the stress from continual harassment of pigs by rodents. Damage caused to pigs and piggeries generally does not receive the same level of attention as the damage to cropping land, but the damage can be just as significant. To minimise the effect of disease, or the chance of infection, rodents must be eliminated from piggeries and carcasses must be removed.

### Are these mice native?

The house mouse (*Mus domesticus*) was introduced to Australia during European settlement. This is the same species found in houses throughout Australia and also in laboratories (white laboratory mouse) and has a global distribution. One reason mouse plagues form in Australia is the lack of competition from other small native herbivores. House mice usually frequent the highly modified agricultural habitats not used by native mice. There are 64 species of native rodents in Australia, 35 of which are about the same size as house mice.

## Contacts

### CSIRO Enquiries

Phone: 1300 363 400

Email: [enquiries@csiro.au](mailto:enquiries@csiro.au)

COPYRIGHT © 2003 CSIRO

To the extent permitted by law, all rights are reserved and no part of these publications covered by copyright may be reproduced or copied in any form or by any means except with the written permission of CSIRO.

#### IMPORTANT DISCLAIMER

To the extent permitted by law, CSIRO (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using these publications (in part or in whole) and any information or material contained in them.