

PestFacts

south-eastern



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The current situation and pest reports

While some regions experienced issues with mice in 2010, this was generally limited and appears to have been overshadowed, to a large degree, by the locust situation. This year however, mice numbers have risen significantly and are affecting large parts of South Australia, Victoria, New South Wales and Queensland. Some regions are affected worse than others; even on a local scale certain paddocks appear to have high mice numbers whereas nearby or adjacent paddocks have very few. As a general rule, mice numbers are driven by an interaction of environmental conditions and individual landholder practices. The summer floods appear to have had little impact on mice populations that built up last year. Being highly mobile, mice can readily move to dry places during floods, and it is thought that only prolonged flooding will have an affect on numbers in the field.

Managing director of Animal Control Technologies Australia (ACTA), Professor Linton Staples says the current mouse situation is very dynamic, and at present appears to be escalating almost daily. Linton says this is the largest mouse problem he has observed in their 15 years of operation. ACTA are currently operating at full capacity to produce MouseOff[®] baits so that they continue to be available to landholders in the coming weeks and months. Enough bait has been produced to treat 600,000 hectares of crops and ACTA are preparing to produce enough bait to cover another

million hectares if needed. According to Linton, the situation this year began 1-2 months earlier than anticipated, and may ultimately end up being 4 times the scale of the largest problem ACTA have previously faced (i.e. in the past 15 years).

Agronomist, Hayden Lunn (Landmark), reports seeing large numbers of mice in recently harvested rice crops near Finley, in the Riverina district of New South Wales. Hayden says the mice were living in the banks and swimming out into the rice bay then climbing plants to eat seed in the rice heads. Some mice were seen swimming out more than 5 m from the banks. Hayden says there is a large amount of concern for newly sown crops in paddocks following rice because once the water is drained the entire paddocks are accessible to mice. Perimeter and whole paddock baiting is likely to be used in an attempt to avoid damage at crop establishment.

Agronomist, Andrew Parr (Howard Martin & Co.), reports finding large numbers of mice holes in banks surrounding rice crops near Berrigan, also in the Riverina district of New South Wales. In other paddocks, Andrew has found significant damage to canola cotyledons caused by mice feeding. Damage was most evident around mouse holes, and along tree lines, where cotyledons were significantly chewed or had been completely removed. We have also received reports of mice causing significant damage to

emerging canola crops north west of Swan Hill, in the Mallee district of Victoria, and north east of Wagga Wagga, in the South West Slopes district of New South Wales. In some cases the damage has meant entire paddocks will need to be re-sown after baiting has been carried out.

For the past 12 months, the Victorian DPI has been undertaking monitoring of mice holes in several paddocks across western Victoria. Through this work the DPI have identified significant mouse activity throughout the central Mallee region. Even in paddocks with little vegetative cover where there were initially thought to be very few mice, high densities of active mice holes have been found concentrated around weeds, large thistles and clumps of grass.

Why is there a mouse problem?

Mice are typically present in crops in most years, however certain conditions result in rapid population growth, which can lead to mouse plagues. Although mice can reproduce at any time of the year if food is available, the normal breeding season is from spring to mid-autumn. The most important driver of mice populations is food availability. Spilt grain from the previous years harvest is a high value food source for mice within paddocks. There was a large amount of grain left in many paddocks last season due to the delayed harvest and decreases in harvest efficiency because of the wet conditions. Spring and summer rainfall also impact mice ecology directly by ensuring the survival and growth of summer weeds and an earlier onset of winter weeds. These provide an important food source for mice.

The availability of shelter is also a key requirement for mice survival. Favourable burrowing conditions are cracking or light soil types, and factors such as minimum tillage, stubble retention and reduced grazing, which provide extra cover and habitat for mice. Haystacks, farm sheds and piles of timber and firewood also provide ideal conditions for mice survival.

Mice have caused problems in grain growing regions of Australia – on and off – for more than 100 years. Serious problems occur on average every 4-10 years, can last up to 2 years, and most commonly follow good cropping seasons. The current situation can be traced back 12-18 months, when numbers first began

to rise. The main causes of collapses in mice populations are cessation of breeding, lack of food resources and the spread of disease. Cold weather and frosts will slow or stop breeding, however this alone will not result in mouse plagues ending completely.

Mouse damage to crops

Consultant, Felicity Pritchard (PACE), says mice cause damage to crops in several ways, depending on the crop stage and type. Mice will dig up and consume newly sown seed of most crops, which results in poor or failed establishment. Felicity says the seeds of many pulse crops have a high nutritional value and this can result in higher fertility rates and a faster build up of mice populations. Mice often follow crop rows and dig up seeds along the way. Under high mice densities, as much as 5% of grain seed can be consumed per night. In canola, damage is more often seen above ground as direct chewing on young plants. This may include complete removal of the cotyledons, which effectively kills the plant because it removes the apical meristem. It is common to observe circular patches of missing crop, or strips missing along paddock edges where there is adjacent cover (e.g. treelines).



Above: Small area of a canola crop attacked by mice shortly after crop emergence, resulting in a circular bare patch commonly observed in 2010.

When cereals are at the tillering stage, mice have a tendency to chew through the first node, and one mouse can affect many plants. Later in the year mice climb stems, and can drop whole heads (usually at the milky stage in cereals), or remove seeds from the heads. For crops such as canola and lupins, mice can

chew on pods and potentially cause significant yield losses. Windrowed crops provide mice with a good shelter source and also allow easy access to grain or seedpods for mice to feed on. Other problems posed by mice are contamination of grain stores and haystacks.



Above: Typical chewing damage to canola pods caused by mice. (Photo: L. Staples)

What can growers do?

MONITORING – Reacting to mouse plagues was standard practice in the past, however with increases in our understanding of mouse ecology, integrated and preventative management is now possible. Once populations reach plague levels, control efforts and damage minimization becomes more difficult. Plagues are generally considered to be anything above 500 mice per hectare and serious plagues occur when there are >1000 mice per hectare. Be aware however that even numbers as low as 100-200 mice per hectare can still cause significant damage. Signs of an overall increase in mouse activity include: numerous burrows, mouse droppings on soil and plants, large numbers of mice seen at night in paddocks and on roads, occasional day time sightings, signs of digging around seed beds and direct chewing to plants.

Once mouse activity is detected, there are several methods that growers can employ to assess population trends over time in their paddocks:

- Hole counts are an established method of estimating mice densities within paddocks. To do this, mark out a 100 m straight line and walk along this transect

counting the number of active holes within a 1 m wide strip (i.e. 100 m² in total). Holding a 'T' shaped stick out in front of you is an easy way to measure a continuous 1 m width. Multiplying the number of holes by 200 provides an estimate of mice per hectare, based on 2 mice per hole (which is a conservative estimate). The actual number of mice per hole will differ depending on the availability of refuges or other cover within the paddock, as well as soil type. If you are uncertain about the activity of a hole, sprinkle talcum powder around it and inspect disturbance of the powder the next morning.

- Census cards typically consist of 10 cm² pieces of light card soaked in canola oil and pegged to the ground randomly across a paddock. Upon checking the cards the next morning, an average of 10% of the card area missing indicates an emerging mouse problem, and 20% or more missing suggests a significant problem may be present. Be aware however that the presence of other food sources may decrease the likelihood of mice chewing on census cards.

- Conventional snap-back traps can also be used in the paddock to gauge mice activity. Traps can be baited with a small piece of cardboard or leather soaked in canola oil, or smeared with peanut butter and set up in transects. Place at least 20 traps at 10 m intervals in a straight line, then check early the next morning. If 10% of traps capture mice, there is potential for significant crop damage.

INTEGRATED MANAGEMENT - Farm hygiene, in particular minimizing the availability of feed through good harvesting techniques and cleaning up around sheds and silos, can go a long way towards preventing a mouse problem. Consideration should also be given to controlling weeds and volunteer plants in autumn before seed-set, and spraying, slashing or burning to remove potential refuges. Natural predators of mice include birds, foxes, feral cats and snakes. Although predators are unlikely to control mice in a plague situation, an increase in predator activity may signal a rise in mice numbers in a paddock.

When mice do pose a threat, growers should aim for early and rapid establishment of strong plants to give crops the best chance of 'outgrowing' the mouse threat at establishment. Increasing seeding rates,

sowing as deeply as appropriate and cross-harrowing to remove sowing lines can be useful techniques. Dry sowing should be avoided (if possible) as seed could be in the ground for some time before germination, leaving it vulnerable to mice searching for food. Heavily grazing paddocks after harvest will help clean up split grain.

The most immediate method of combating a mouse problem is baiting. There are two rodenticides currently registered for field use. Zinc phosphide applied to sterilised wheat (MouseOff® ZP) can be applied to broad-acre crops, at a rate of 1kg/ha, which results in an even coverage of 2-3 grains per m², or about 20,000 lethal doses per hectare. This rate is thought to be sufficient in the majority of instances and should provide greater than 90% control. A secondary baiting is only likely to be needed in localised situations. Lower rates should be avoided as trials have shown significantly less control is achieved and re-infiltration is possible. Bromadiolone-based baits (MouseOff® BD) can be used as perimeter baits and along fencelines, but are not registered for use within crops. If the current bait production rate is sustained and there are no supply-chain limitations, it is expected that ACTA will be able to keep up with the demand for MouseOff® baits across all affected regions this season.

Growers should consult product labels for instructions before applying baits and recognise that baiting in a single paddock alone may not be effective if mice are problematic in surrounding paddocks. This is because mice are highly mobile, particularly when in search of food. They have been recorded travelling several hundred metres in one night, and much larger distances over several consecutive nights. It is important to understand the potential for reinvasion of mice into baited areas before assuming a baiting failure. Growers are reminded that the preparation of 'home-made' baits is not only illegal, but also potentially dangerous to personnel as well as being harmful to non-target animals.

Further information

GRDC:

- [GRDC Mouse Management Fact Sheet](#)

Animal Control Technologies Australia:

- [Mouse problems in Australia](#)
- [Mouse Biology](#)
- [Monitoring mice and assessing crop risk](#)

Victorian Department of Primary Industries:

- [House mice in Victoria](#)

New South Wales Primary Industries:

- [Zinc phosphide and bromadiolone: frequently asked questions about mouse baiting](#)
- [The Mouse Trap newsletter](#)

PestFacts south-eastern is a free e-mail service designed to keep growers and farm advisers informed about invertebrate pest-related issues – and solutions – as they emerge during the winter growing season. The service has a focus on pests of broad-acre grain crops in south-eastern Australia and is supported by the GRDC's National Invertebrate Pest Initiative.

PestFacts south-eastern is produced on an 'as-needs' basis and relies upon pest observations and field reports from our subscribers. If you have recently observed invertebrate pests (or beneficial species) in crops and pastures, contact Dr Paul Umina or Stuart McColl on +61 3 9329 8816 or email stuart@cesarconsultants.com.au

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