Upper North Farming Systems

Pest Management Guideline

Mice

The common house mouse or *Mus domesticus*. Photo: JN Stuart

Key Facts

- Stubble retention increases the risk of mouse damage by providing a habitat and food source.
- Monitoring should be performed prior to sowing by looking for burrows or by using chew cards.
- To improve chances of success, baiting of mice should be over a large scale.
- Baiting should take place no later than 24 hours after seeding.

Mice (*Mus domesticus*) are a significant grain growing pest across Australia. Mice begin breeding in early spring and numbers increase through spring and into summer. Populations usually decline in winter. Stubbles, along with growing plants, provide shelter and a food source for mice over the summer.

MICE IN GRAIN CROPPING

Mice build up locally within paddocks and generally travel around 100m to forage for food. Mouse densities of more than 200 mice per hectare will cause economic damage at sowing, with a plague defined as more than 800 mice/ha.

Plagues usually build up over 12 to 18 months and decline after one to two years, though it is possible for plagues to last longer than two years.
Crop damage is most severe for about two to three weeks after crop emergence, then again at seed set. However, mice will sometimes cause damage at stem elongation and tillering.

Factors that promote mouse abundance include:

- Stubble retention.
- Grain left in the paddock from poor harvesting efficiency or weather events.
- Poor grain storage hygiene.
- Rain outside the growing season.
- Summer weeds.

MONITORING

The most important times to undertake monitoring are prior to sowing and in early spring, and the two recommended methods of monitoring are looking for burrows or chew cards. Trapping is not recommended, because it is labour intensive and can trap native animals.

Looking for evidence of active burrows is recommended if abundant food sources are present (see 'burrow monitoring').

Project Information

This management guideline has been developed for the Upper North Farming Systems Group (UNFS) as part of the Maintaining Profitable Farming Systems with Retained Stubble Initiative, funded by the Grains Research and Development Corporation (GRDC).

The Stubble Initiative involves farming systems groups in Victoria, South Australia and southern and central New South Wales, collaborating with research organisations and agribusiness, to address challenges associated with stubble retention.

The GRDC, on behalf of growers and the Australian Government, is investing $17.5 million in the initiative that has been instigated by the GRDC Southern Regional Panel and the four Regional Cropping Solutions Networks that support the panel.

Growers should also use the MouseAlert app and website to both report mouse sightings and to review other growers' reported mouse sightings, to gain a better understanding of mouse populations and the likelihood of an upcoming plague.

MOUSE CONTROL

Mouse control should be conducted over a large area to reduce the likelihood of re-invasion. An area of 1000ha is considered ideal. Working with neighbouring growers to coordinate control over a 1000Ha will give the highest chance of success.

Prevention is better than cure for mouse control as bait costs are high and often increase during plagues due to high demand.

Prevention

Methods to minimise the build-up of mouse populations:

- Ensure harvester efficiency is high or consider grazing to clean up spilt grain.
- Weed seed removal or destruction can minimise food sources in summer.
- Maintain good grain storage hygiene to minimise spilt grain
- Control summer weeds to reduce feed sources.

Baiting

The GRDC provides the following guidelines on mouse baiting:

- If numbers are high, bait six weeks before sowing and again at seeding. If only baiting once, bait at seeding.
- Bait within 24 hours of seeding; any later will not be effective. A bait spreader on the back of the seeder is the simplest method to achieve this.
- Bait at label rates. In trials of zinc phosphide-treated wheat grains at 1kg/ha, 90–95% of the mouse population in the baited area were killed.

BURROW MONITORING

To get an accurate gauge on mouse numbers, growers can use the following guide:

1. Walk 30 metres in from the edge of the paddock and follow a 100 metre long by 1m wide path through the crop, following the furrows.
2. Walk slowly along the path, scanning for evidence of mouse burrows. Be sure to keep within the 1m transect width.
3. Take note of any mouse burrow that looks active.
4. Record the number of burrows per 100m path.
5. Repeat across 2-4 paths to cover a large area.
6. A mouse problem exists if there are more than 2-3 active burrows per 100m.

Source: GRDC

Putting it into practice - farmer feedback on mice

Chris Crouch, Wandearah

Wandearah grower Chris Crouch has seen an increase in mouse numbers in the past 15 years since his family has been retaining stubble, with the stubble supporting a low 'starting' population ready to thrive when the conditions are right.

The two most recent seasons to have had mouse issues, 2011 and 2017, were both characterised by a large harvest the previous year followed by a wet summer.

In 2011 the mice caused problems during establishment and increased operating costs but did not affect yield. In 2017, Chris expected yield losses in chickpeas after a mild winter allowed mice to cause damage in both autumn and spring.

Chris performed significant baiting in spring for the first time in 2017; almost his whole program was baited at sowing and some repeated in spring. This meant he used more bait over the 2017 season than ever before.

The Crouches are prepared to bait regularly, with Chris assessing the benefits as well worth the cost, particularly after recent reductions in the cost of bait.

However, they also use many cultural measures to control mice and Chris believes each of the measures play their part in reducing mice damage:

- Cattle graze stubbles in summer to remove spilt grain, with agisted sheep used in 2016/17 to improve the grazing effectiveness.
- When mouse pressure is high, Chris sows some crops deeper to reduce the potential for mice to eat seed.
- Summer weed control reduces alternative feed sources in the lead up to seeding.
- Early sowing from mid-April improves early establishment. In 2017, Chris could sow early after good rainfall but he would also sow dry early if he needed to, with bait applied at the same time.