

Developments in fertility control for pest animal management

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Abstract. In south-eastern Australia and in Asia, the economic and social impact of pest rodent species is high. Chemical control is widely applied as the primary method for managing these and other mammalian pests, as well as weeds and pest insects in agricultural production or conservation areas. Chemicals often provide effective short-term control, but are neither target specific nor cost-effective in the long term. With widespread and increasing concerns about the use of chemicals in the environment, and pressures to produce environmentally acceptable products for domestic and export markets, alternative approaches to pest management are required. For mammalian pests, fertility control using immunocontraception is being developed.

We are examining whether mouse populations can be managed using fertility control delivered either by a non-infectious infertility agent in a non-toxic bait, or by infectious viruses which are carriers of the agent. To date, laboratory studies have demonstrated that genetically engineered mouse viruses, such as mouse cytomegalovirus (MCMV) and ectromelia virus expressing mouse zona pellucida 3 can induce long-term infertility in laboratory and wild house mice. Field enclosure studies have shown that surgical sterilisation of 60–70% of each cohort significantly reduces recruitment over 32 weeks, and we have demonstrated that wild-type viruses introduced into field enclosures will transmit to uninfected adults and their young.

This is a large, multi-disciplinary research program where biotechnological approaches, studies of the population ecology of mice and the epidemiology of the viral vector, MCMV, are being addressed. The use of this technology requires acceptance by the public of the risks and benefits, and must comply with Australian government (and international) regulatory requirements. There are still many steps to be completed before this fertility control approach can be applied in the field as part of an integrated management strategy.