Calicivirus and climate: investigating the link

A MODEL developed by CSIRO's Division of Wildlife and Ecology based on climatic data could provide a useful tool to predict the spread of rabbit calicivirus disease.

The virus can be spread in a number of ways, including rabbit to rabbit contact or mechanical spread by birds, insects and even people. But which of these is responsible for its spread across Australia in recent months is yet to be determined.

The discovery of regular outbreaks on an ever-widening front suggests that the calicivirus is spreading by biological means, rather than by human intervention, according to principal research scientist with CSIRO's Division of Wildlife and Ecology, Dr Brian Cooke.

Cooke has designed a model to investigate how the disease is spreading, based on the concept that movement of the virus could be linked with an insect vector and climatic patterns.

'A flying insect that transfers the virus between rabbits can improve the rate of spread or change the epidemiology of the disease', Cooke says. 'The absence or presence of insects can be predicted to some extent using climate.'

The model uses the CLIMEX database developed by CSIRO, a useful tool for generating a climatic picture of different parts of Australia and therefore determining when insects are most likely to be active.

Using the model, Cooke predicts that the virus is likely to flare again in spring and move to the south-west region of Western Australia.

'Of course, this is only theoretical, as a demonstrated vector for the rabbit calicivirus is yet to be identified,' Cooke says. 'The model's correlation is with climate, not necessarily the vector.'

The model is likely to prove an important tool to states and territories ensuring the virus is released effectively in various regions.

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Testing the defences of transgenic cottons

Field trials have been approved by the Federal Government's Genetic Manipulation Advisory Committee for CSIRO Plant Industry to continue evaluation of new cotton varieties developed through gene technology.

The small-scale trials will be conducted later this year in New South Wales cotton regions, pending approval from the National Registration Authority. Following four years of other field trials, the first commercial release of cotton with in-built protection against pests will occur this year. The cotton contains the Ingard gene by Monsanto, which is derived from soil-borne bacterium and provides protection against caterpillar pests.

One aspect of the trials will be to assess the performance of cotton plants containing a second gene for protection against these caterpillars. CSIRO Plant Industry researcher, Dr Danny Llewellyn, says the new lines could significantly delay the period before insects learn how to beat the new defences of the genetically-altered plants.

The first commercial release of cotton with in-built pest protection will occur this year.

'By having two different genes which kill the insect, rather than one, we hope to dramatically reduce the chances of the insect building up resistance to the plant,' Llewellyn says. 'The second gene should make it harder for the insects to evolve a resistance mechanism to either of the genes. It is highly unlikely that the insect will be able to develop resistance to two genes at the same time.'

The division is also assessing the performance of transgenic cotton plants which have been altered to resist certain biodegradable herbicides such as glyphosate. The trials will be carried out in north-western NSW at the Australian Cotton Research Institute and Plant Breeding Institute, both at Narrabri, and at other trial sites at Tambar Springs and Boggabilla.

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