

# Counting the cost of pesticide resistance

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(PhysOrg.com) -- Researchers from the Beef CRC have developed a new test which could help producers minimise acaricide resistance in cattle ticks (*Rhipicephalus (Boophilus) microplus*).

Resistance to acaricides (pesticides that kill ticks and mites) is a huge economic cost to the northern beef industry which already spends about eight million dollars each year in controlling ticks.

Associate Professor Nick Jonsson, Associate Dean of Research for the Faculty of Natural Resources, Agriculture and Veterinary Science at The University of Queensland said his team had uncovered the genetic mutation which caused ticks to be resistant to synthetic pyrethroids (SPs) in Australia.

"The mutation is in the same gene as the one which causes resistance to SPs in Latin America. But it is a completely different mutation in Australia," Associate Professor Jonsson said.

SPs are just one of four groups of acaricides used in Australia. Amitraz, macrocyclic lactones (MLs) and fluazuron are also used to control ticks. Associate Professor Jonsson said amitraz is most widely used, but 50 percent of all the ticks tested are resistant to SPs.

"SPs and amitraz are the cheapest products. If ticks are resistant to these products, producers are forced to use an ML or fluazuron which cost about five to 10 times as much per animal to use," he said.

Associate Professor Jonsson said that producers preferred to use products which were cheap and convenient to apply.

"If a product isn't working, the producer either puts up with the lower level of efficacy or shifts to another, perhaps more expensive product," Associate Professor Jonsson said.

"This means they may sacrifice some control to reduce the overall cost of protecting their herds against ticks."

The new molecular test is much quicker than the current bio-assay, which can take up to eight weeks to confirm resistance in ticks.

"We currently collect a sample of fully engorged female ticks from a property and allow them to produce eggs," he said.

"We then expose their larvae to several different acaricides to see which ones they are sensitive to.

"All we have to do now is crush the ticks and extract their DNA. We genotype them to see whether they carry the particular mutation; we're almost 100 per cent sure if they carry that mutation they will be resistant to SPs."

While individual farmers are unlikely to use the test, it will assist further research into which strategies can help reduce acaricide resistance.

"Some people advocate rotating acaricides. Others claim you should manipulate the dose. People assume this can cause problems but no-one has ever tested it, so there is absolutely no data to say whether these strategies are valuable. We can now test these theories."

Associate Professor Jonsson said field tests were now dependent on

securing further research funds.

Provided by University of Queensland

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