

On the trail of the worm

E.cervi doesn't have a major impact on the health of New Zealand deer, but any animal disease is now a potential trade threat. The parasite is hard to detect, but **Hugh de Lacy** interviewed a visiting Canadian scientist who thinks he may be on the track of the elusive creature.

COME SEPTEMBER there should be a test that picks up the presence of the parasite *E.cervi* in Red deer in at least 95 per cent of cases, a key to reopening the export trade in live deer to Canada.

That's the goal of Mike Duffy, a Canadian research student from the University of New Brunswick, and AgResearch scientist Ken Waldrup.

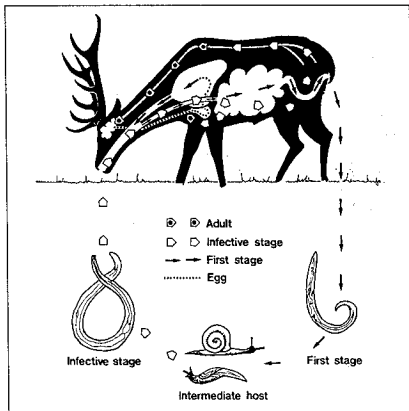
Since November last year they have been working at Invermay AgResearch in Mosgiel on the detection of *Elaphostrongylus cervi*, or tissue worm.

While the parasite has made little direct impact on New Zealand deer, it was responsible for a 1991 Canadian suspension of all live Red deer imports from New Zealand.

This followed an outbreak in several deer in a herd of 250 Reds imported from New Zealand.

The deer were under quarantine at the Coldstream Deer Group's farm in Ontario when the discovery was made.

The herd had been quarantined in New Zealand - 60 days on-farm and 30 days pre-export. During that time the parasite had escaped detection



E.cervi lifecycle

Ingested with the host slug, the worm enters the deer gut, and migrates to the tissues

damage to Red deer but can create progressive and irreversible paralysis in North American Moose and Mule deer.

The Canadians' abrupt suspension of live imports was no disguised trade barrier, say Duffy and Waldrup. It reflected the Canadian view of their native deer species.

"To Canadians, deer are national treasures - they don't view them the way New Zealand views them, as a pest in the bush," says Waldrup.

Though most Canadians cherish their cervine treasures for aesthetic and environmental reasons, another measure of their value is the queue that forms for the opportunity to hunt them.

In Mike Duffy's home territory of New Brunswick, would-be hunters can enter

their names in a draw for 6,000 Moose hunting licences, valid for a three-day season on the last weekend of September.

Each hunter can only apply once every six years. Some 40,000 apply for a licence every year and, if they beat the seven-to-one odds of getting one, gratefully acknowledge their privilege with a \$50 licence fee.

despite faecal tests carried out under the export protocol.

Shortly afterwards, another New Zealand herd undergoing quarantine in Canada was also found to be infected with *E.cervi*.

Eventually, all the stock involved were slaughtered, and all further Red imports barred.

The parasitic worm does little

New Zealand's stake in detecting *E.cervi* goes beyond the live export trade.

There is also a danger that some barriers to agricultural trade, supposedly swept away by the GATT, may be reinvented as health barriers.

A disbarment by one country of live exports of one species might offer a pretext for other countries to refuse entry to meat products of any species.

That aside, the direct danger of *E.cervi* to New Zealand venison exports is minimal.

The parasite seldom occurs in farmed deer: Doug Gordon, the meat inspector at PPCS' Mossburn plant, says he hasn't seen it in a farmed carcass in two years.

The incidence in wild carcasses out of Fiordland is perhaps one per cent.

The *E.cervi* worm ends up in the connective tissues between muscles, discolouring the film lime-green or yellow.

Frequently the infected area can be cut out, but whole carcasses can be affected and condemned.

Deer pick up the parasite by ingesting infected slugs or snails.



Mike Duffy

The worm exits the slug in the digestive tract of the deer and initially migrates into the spinal cord, later further migrating to the tissues in between the muscle groups.

The goal of Duffy's work at Invermay is to replace the embarrassing old faecal examination test with "a reliable diagnostic procedure to identify animals prior to shipment out of the country".

His work is funded jointly by the National Research Foundation of

Canada, the Canadian Venison Council and Fundy Deer Farms, with additional support from AgResearch.

After collecting *E.cervi* larvae and worms from Mossburn, and infecting 42 deer at Invermay with various parasites so their immune responses could be compared, Duffy is now at the business end of his work.

This is a blood-test – an enzyme-linked immuno sorbent assay (ELISA) – for antibodies.

It's a similar procedure to the antibody part of the tuberculosis blood test for deer, and to that for diagnosing a range of infections in humans.

Its use in detecting parasite infections in deer has so far yielded encouraging results.

Underwriting Duffy's confidence in developing an *E.cervi* test by September are the good results he achieved last year in Canada from a pilot programme with Dr Michael Burt of the University of New Brunswick.

Using similar means they were able to identify infections of a white-tailed deer parasite, *P.tenui*, or brain worm. □