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The pesticide residue problem in beef cattle - success with contaminated power poles in south coastal areas

By Bob Mitchell, Regional Veterinary Officer, Albany

Western Australian beef producers faced a major crisis in 1987 because of organochlorine pesticide residues in some Australian beef cattle.

We had to react quickly to find the sources of these residues and to keep contaminated cattle out of our abattoirs. Trace-backs led to 269 Western Australian properties in quarantine by the end of 1987.

About 85 per cent of quarantined properties had cattle contaminated with pesticide residues from 'broadacre' sources, especially from potato and other horticultural crops.

Another 10 per cent of properties were in quarantine because of contamination from basal treatment of timber power poles.

The source of contamination on the remaining properties was either from traded cattle, from sprays for Argentine ant control or it was not known.

Soil tests of paddocks showed that dieldrin or heptachlor residues produced residues in body fat of cattle which grazed pastures on contaminated land or grazed too close so that soil was ingested, or where cattle wallowed around pesticide-treated poles.

South coast had more 'point sources'

In the Department of Agriculture's Albany advisory area only about half of the 31 farms in quarantine at the end of 1987 had 'broadacre' sources of pesticide residues. 'Point' sources were checked and State Energy Commission of Western Australia (SECWA) power poles were found to be the origin of the residues on nearly all of the remaining quarantined farms.

Up until 1984, SECWA used aldrin and dieldrin in a mixture with distillate or coal tar to protect the bases of timber power poles against termites and fungal attack. The mixture was applied in a narrow ring, generally only about 20 cm wide, in the soil around each pole. With most poles the levels of dieldrin or aldrin in the soil ranged from 20 to 1,600 parts per million (ppm) 20 cm from the pole. The residue level one metre away from the pole was only 1 ppm.

Farmers initially were advised to cover basal areas around power poles with rocks or gravel as temporary 'insurance'. A concrete 'collar' of one metre radius could also be used to cover almost all the contaminated area.
Department of Agriculture veterinarian Hugo Dunlop and his research team worked with SECWA chemists to identify the main common causes of chemical residues in beef cattle caused by dieldrin around treated power poles. Mobs of cattle were fat-tested and their access to wallowed poles recorded. Veterinary officer Michelle Bowden did most of the fat-tests.

**Wallows around power poles**

Quarantined properties were more likely to have a residue trace-back when cattle had wallowed or dug in the soil around the base of SECWA poles.

Cattle which had grazed around poles with wallows were about 15 times more likely to have organochlorine residues in excess of 0.2 mg/kg, the violative dieldrin concentration, than were cattle that grazed around poles without wallows.

Soil type was another factor. Sandy soils were found to have 10 times as much chance of producing residue problems in cattle as heavier clay or loam soils.

We believe the cattle dig up the soil around poles and that it is easier for them to dig and roll in sandy soil than heavier soils. They may then lick their coats or actually ingest soil which is contaminated with dieldrin.

**Initial action on quarantined properties**

On the 31 quarantined beef properties from which cattle had violative fat tests at the abattoir, concrete collars were fitted to 514 SECWA poles.

Twenty ‘black-listed’ properties, whose cattle had enough dieldrin detected at abattoirs to make the meat trade reluctant to bid on them, had concrete collars applied to 362 poles. This action was recommended if the power poles were believed to be the source of dieldrin.

**Prevention is better than quarantine**

The Department of Agriculture and SECWA officers jointly recommended that the best way for many properties to avoid having violative cattle was to cover the soil around wallowed power poles.

Apart from the impact of quarantine on cattle trading, fat testing took considerable time and effort and was expensive. Veterinarians took a sample of fat from about 20 cattle from every quarantined mob. Each laboratory fat test cost about $30. The Government paid these costs on quarantined farms or farms that were black-listed. On some properties $4,000 was spent on fat tests before the property was released from quarantine. This sum excluded the value of the condemned carcass at the initial trace-back and other on-farm costs.
It was better to stop the source of dieldrin than have residues found in cattle fat and then have to fat-test numerous stock.

**Local extension programme**

In June 1988 each cattle producer in the Shires of Albany, Plantagenet, Jerramungup and Denmark was sent a letter, and a form on which to report any wallowed SECWA poles. Later, letters and forms were sent to cattle producers in parts of Ravensthorpe Shire and the Walpole district. About 1,400 property owners were contacted, and a third (425) returned completed wallow report forms. About 100 of the returned forms reported no problems with wallows around power poles.

About half of the 425 forms returned to the Department of Agriculture at Albany stated that the owners were concerned about some wallowed poles on their farms. The worst wallowed pole was identified by the farmer and assessed by either Department of Agriculture or SECWA officers.

If there was no wallowing, especially if grass was growing up to the base of the poles other than the herbicide-treated fuse poles, there was no point in fitting concrete collars.

SECWA worked progressively through the region fitting concrete collars to power poles during a very wet 1988. The drier more accessible areas of Albany, Plantagenet and Jerramungup shires were completed by October 1988. The wetter parts of Albany and Denmark shires and Walpole posed a problem for the SECWA contractors and their trucks carrying concrete. Between November 1988 and May 1989 all necessary collars were installed before the ground became too boggy again.

Of the 216 properties on which concrete collars were fitted to power poles, 96 are in the Shire of Albany, 64 in Plantagenet, 44 in Denmark, and a total of 12 from Bremer Bay, Jerramungup, Ravensthorpe and Walpole. The Department of Agriculture's Esperance office coordinated the fitting of collars on additional properties from Ravensthorpe and Esperance.

**Did this preventive policy work?**

A comparison of the relative number of properties in quarantine in the Albany district in 1987 and in 1989 is a good guide as to whether this policy was successful.

In the Albany district an average of 20 to 25 properties were in quarantine from late 1987 because of contamination of beef cattle from pesticide-treated SECWA poles. Some properties were released after expensive fat test programmes and much effort. But trace-backs from abattoirs kept new properties coming into quarantine.

By February 1989, only one property was in quarantine where power poles were considered the source of chemical residue. New trace-backs to the south coast area became much less common.

There are 242 cattle farmers on 448 locations with a total of 3,317 concrete collars around power poles along the south coast. These collars will keep future cattle from wallowing in the dieldrin-contaminated soil.

This installation has involved much work, thanks to the efforts of, among others, Rod Newton, Albany Regional Manager of SECWA and Carl West, Foreman for the Pesticide Programme. Some 1,212 cubic metres of concrete and 1,447 tonnes of bluemetal dust were used to fill the wallows. The cost to SECWA of the programme in the Albany district to February 1989 was $432,000.

Pesticide residues in beef cattle will occasionally be traced back to properties with probably wallowed and uncollared SECWA poles, but I estimate that about 95 per cent of the problem has been solved.