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The bush tick

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A newly discovered livestock parasite has focused attention on farms in the Walpole district in the south-west of Western Australia. Ticks submitted to the Department of Agriculture in December 1983 were identified as the bush tick, Haemaphysalis longicornis. An intensive campaign to locate areas of infestation and to limit spread was started in January 1984.

The bush tick is a pest of livestock in some parts of New South Wales and Queensland. It is important in a narrow coastal strip from Sydney to Brisbane where total summer rainfall can exceed 1000 mm. In this area, heavy tick infestation causes anaemia and ill thrift in cattle. Occasionally, massive numbers of ticks, from 10,000 to 20,000 per beast, may cause death. Fortunately the bush tick does not carry tick fever or any other stock disease.

However, in areas with drier summers such as the south-west of Western Australia, the tick is rarely found in large numbers and control measures are seldom necessary. Before a decision is taken to limit or contain the tick's spread in this State, information is needed on:

- How far has the tick spread?
- How far is it likely to spread?
- How important it is likely to be in Western Australia?
- How it can be controlled.
most properties only a few animals were infested, usually with only one or two ticks. Movements of stock from infested properties were traced, but only within the Walpole district had movements led to new infestations. Stock movements to Albany, Denmark and Manjimup properties did not appear to spread the tick to these districts.

Walpole farmers co-operated greatly in the inspection campaign. A meeting was held early in January to inform farmers of the situation and to ask for reports of ticks on their animals. Stock movement restrictions imposed on the districts were accepted by farmers as necessary until more was known of the infestation. A second meeting was held in March 1984 to inform farmers of the results of the investigation.

**Origin of the tick**

The origin of the tick is obscure. No stock have been introduced to the South-West of the State from the endemic area of New South Wales or Queensland in recent years, so it is possible that farm livestock were not the carriers. The tick may have been introduced on a pet, but the source may never be identified.

It is likely that the tick has been present in the Walpole district for several years and perhaps the climatic conditions only favour them in certain years. The build-up to the numbers seen early in 1984 would probably require several generations of ticks. The distribution pattern of ticks in the district also suggests a slow spread over several years.

**Biology of the bush tick**

The bush tick is primarily a parasite of cattle, but has been found on a range of domestic animals, as well as marsupials and even birds. In most species it favours sites between the legs, around the tail, on the udder, and inside the ears of dogs and sheep.

The bush tick is referred to as a three-host tick. Each of the tick's three stages (larvae, nymphs and adults) must attach to a host animal and suck blood for a few days before dropping back on to pasture.

Adult female ticks lay eggs on the pasture, and these hatch into larvae. Larval ticks attach to a host, feed, drop off and moult to become nymphs. Nymphs again find a host, feed, and after dropping off, moult to the adult stage. Both larvae and nymphs are small and not easily seen with the naked eye. The adults, however, grow to the size of a pea over the five or six days they remain on the host before they fall off to lay eggs.

In Australia the life cycle takes about 12 months, and is greatly influenced by climate. During the cold months little development takes place but warm weather promotes tick activity. Adult ticks are seen mainly in summer, when
most eggs are laid. Unless moist conditions are available, most tick eggs will die. Consequently, areas with summer rainfall are best suited to the bush tick.

Once pastures are infested, and if climatic conditions are ideal, some stages of the tick can survive for up to 18 months.

**Bush tick spread**

Will the tick spread far from Walpole, and how important will it be?

The answers to these questions were sought by comparing climatic data from Walpole and other areas of Western Australia with similar data from areas in New South Wales and Queensland where the tick thrives. CSIRO scientists in Brisbane have developed a model of the life cycle of the tick, using a computer to show how different climatic conditions affect the various stages of development. Running the Western Australian data through the computer showed that virtually no areas of the State really suit the tick.

In Western Australia our hot dry summers limit the spread of the tick. Without moisture, few tick eggs or larvae survive on pasture. Even in Walpole the tick is unlikely to thrive, but it will certainly survive in moist areas of dense pasture and along creek banks. Outside the Walpole district there are few favoured locations. The tick would probably survive over summer in moist areas along the south coast, perhaps as far as Albany. Inland, conditions are too dry, and it is both too hot and too dry along the west coast.

Climatic data therefore indicate that the tick will survive in sheltered locations in a narrow strip along the south coast, but will rarely attain large numbers on pasture.

**Eradication**

A decision to eradicate a pest involves two main considerations: the technical possibility, and the economic benefit.

Technically, bush tick eradication would be very difficult. Stock grazing infested areas, plus a ‘buffer’ zone, would need to be sprayed regularly to ensure a residual level of chemical remained at all times to kill attacking ticks. In practical terms, this would mean spraying all livestock and pets on about 50 properties in the district every three weeks, for a two-year period, to ensure that all pasture stages of the tick are dead. However, even this programme would not succeed unless there was no possibility of reinfection. The recent discovery of bush ticks on foxes in the area makes eradication an even more doubtful prospect.

Even if it were technically feasible to eradicate the bush tick, it may not be economically worthwhile. It is estimated that eradication would cost several hundred thousand dollars, apart from the mustering costs to farmers. It appears unlikely that production losses from tick infestation would ever amount to more than a fraction of this figure.

If the tick is not eradicated, can farmers live with it?

Occasional outbreaks of tick infestation will probably occur, especially in years of high summer rainfall. However, cattle do develop a strong immunity to ticks, and if infested in one year they pick up fewer ticks in subsequent years. It is therefore likely that any problems would be seen only in young stock and in introduced stock.

**Control**

Grazing management could be arranged to avoid putting these animals on ‘ticky’ paddocks. On any property only some paddocks will contain areas favourable to ticks. On these paddocks, tick infestation can be reduced by burning or slashing. Heavy grazing before summer will help to reduce the pasture cover which shelters the ticks.

Spraying cattle would both eliminate the immediate problem and protect cattle for some time. Chemicals are available which do not penetrate beyond the skin, and are of very low toxicity to non-target species. As adult ticks are only present in summer, one or two sprays over this period should control any ticks that develop.

**The future**

On the basis of technical and economic information, the Department of Agriculture has decided not to attempt to eradicate the bush tick. It appears that the tick will be of very limited importance, and adequate control measures are available.

Restrictions on stock movements have been lifted, but the Department will continue to monitor tick activity in the area. Properties will be inspected each year to check whether ticks have spread, and a research programme is planned to provide more detailed information. It will be possible to update control advice as required, and eventually it may be possible to predict the likely tick activity in any given year.

**Acknowledgements**

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