Cattle Tick and its Application to the Cattle Industry

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In the last issue an article by Dr Owen gave a detailed account of the life cycle and various characteristics of the cattle tick (Boophilus microplus).

This article deals with the practical problems related to tick fever, tick eradication, tick control and legal responsibilities of stock owners.

ECONOMIC IMPORTANCE OF CATTLE TICK

The presence of cattle tick in a herd can greatly reduce performance due both to the irritation caused by the tick and, most importantly, to the spread of tick fever, a disease which can kill cattle.

As well as this loss of production, the cost of the treatment of tick fever, tick control measures or tick eradication is a direct drain on the profits which can be obtained from cattle grazing.

Heavy infestations of tick will cause anaemia anl restrict growth, and therefore steers need to be held a year or more longer than normal before they are marketable.

A measure of the loss of production caused by cattle tick can be seen from these figures obtained in north Australia. A group of undipped, tick-infested cattle gained only 42 lb per head over a 6-month period. By contrast a group of similar cattle on identical pasture that were dipped regularly gained 132 lb per head over the same period. Another experiment demonstrated that average infestations of 40, 60 and 80 ticks on cattle caused a loss of growth rate of 56, 108 and 160 lb per year respectively under the conditions of the experiment. Although this research was done in Australia, it is an indication of the possible losses that can occur through the parasitic action of cattle tick. Because the skin is irritated where the tick have attached themselves, hides also can be damaged and the wound open to attack by the screw worm fly which can cause further losses in production.

Tick Fever

Tick fever is the name given to the various similar diseases caused by minute organisms called protozoa. When tick fever is present in the herd these protozoa live within the blood cells and destroy them, thus causing the disease.

It should be clearly understood that while the direct cause of the disease is a protozoan, the only method of spread of the disease is by the bite of the cattle tick. If there are no ticks on a herd, there can be no spread of tick fever. Cattle tick do not pass from one animal to another but spend their entire feeding period on a single animal. The germs of tick fever (protozoa) pass through the eggs of diseased ticks to their young and the young later get on new animals and so infect them.

The most common form of tick fever here is that caused by the protozoa *Babesia argentina.* In 1966 deaths due to *Babesia argentina* occurred in three herds in the Central District. One of these herds lost 75 head. A serological study at the time indicated a widespread infection of *Babesia argentina* in the Port Moresby and Sogeri areas.

Cattle are very susceptible to babesiosis (tick fever caused by *B. argentina* and a similar organism *Babesia bigemina*) when they have little or no resistance. This resistance is obtained by the continued presence of a small number of ticks carrying tick fever. The introduction of tick fever to a herd with little or no resistance can result in a very high number of deaths. Milking cows and pregnant animals are most susceptible, but calves have a resistance to infection and seldom suffer a severe attack.

The symptoms of the disease are high fever, loss of appetite, rapid breathing, loss of weight and dejected appearance, and in the advanced stages of the disease, the passing of red-coloured urine. This is due to the rapid destruction of blood cells.

In dead animals, fat and mucous membranes are often yellow, the spleen is swollen and pulpy, the liver is swollen and coloured yellow to orange, the bile thick and granular and the bladder may contain red urine.

There are drugs which can be used to treat cattle showing symptoms of babesiosis, and early veterinary advice should therefore be sought where tick fever is suspected.

Anaplasmosis is another type of tick fever but is not very common. It is like babesiosis except that there is no red urine.

TICK ERADICATION

The Highlands and the New Guinea mainland have had successful eradication schemes and these areas are now tick-free. The New Guinea Islands are tick-free except for a very small number of cattle on New Ireland where there are also some wild cattle.

In Papua, the Northern District and Southern Highlands are the only tick-free districts but tick has been eradicated from the Woitape and Tapini areas and from parts of the Milne Bay District. Eradication schemes are at present being conducted in the Bereina and Papuan south coast areas.

In the Port Moresby area the scheme was abandoned because of the presence of deer which also carry the cattle tick. Properties around Port Moresby and on the Sogeri Plateau now carry out control spraying. The presence of deer in the Western District will also restrict future attempts at eradication there.

The eradication scheme is a series of strictly controlled sprayings of all animals in the herd at very frequent and regular intervals. Tick eradication is carried out under the supervision of Livestock Officers and Veterinary Officers of DASF.

The most common method used is to spray the cattle weekly until 3 months after the last tick was sighted on the herd. The interval between spraying is then increased to every 2 weeks. Spraying is continued for a further 15 months provided there are no more tick sightings.

A second method of eradication involves the movement of livestock, after they have been intensively sprayed and all their ticks have been killed, to tick-free pastures for a long period to allow the ticks on the original pasture to die. Present DASF policy for this eradication is to leave the pastures without stock for 18 months.

Plate 1.—Machine spraying of cattle for tick. Because of the high pressure developed by the machine, this is the recommended method of spraying.

TICK CONTROL

In areas where there are ticks and no tick eradication is in progress, stock owners are required by law to carry out measures to control the infestation of tick in their herd.

These control measures are particularly applicable to stock owners in the Central District and other areas where deer have restricted the possibility of tick eradication.

The purpose of tick control is to keep the cattle tick to a minimum and this is usually done by the application of an insecticide by spraying approximately every 3 weeks. This interval can be adjusted by the farmer according to the number of ticks on the cattle. Some of the insecticides approved by DASF are Diazanon 20 per cent emulsion, Ausuntol 45 per cent wettable powder and Delnav 30 per cent emulsion.

If stock owners are using other insecticides a check with a Stock Inspector (Veterinary Officer or Livestock Officer) will determine if the insecticide is suitable.

The insecticide can be applied by dipping or spraying and the animals must be completely wetted by the solution. A machine must be used to apply spray and it must be capable of delivering the solution at a pressure of 150 lb per square inch.

The insecticide dilution must be no weaker than the dilution recommended by its manufacturer.

Control of Spelling

All ticks live by sucking the blood of a host animal. In the case of the cattle tick the host animal can be either cattle or deer. It is while the ticks are attached to the skin of the host that they develop from larvae to mature

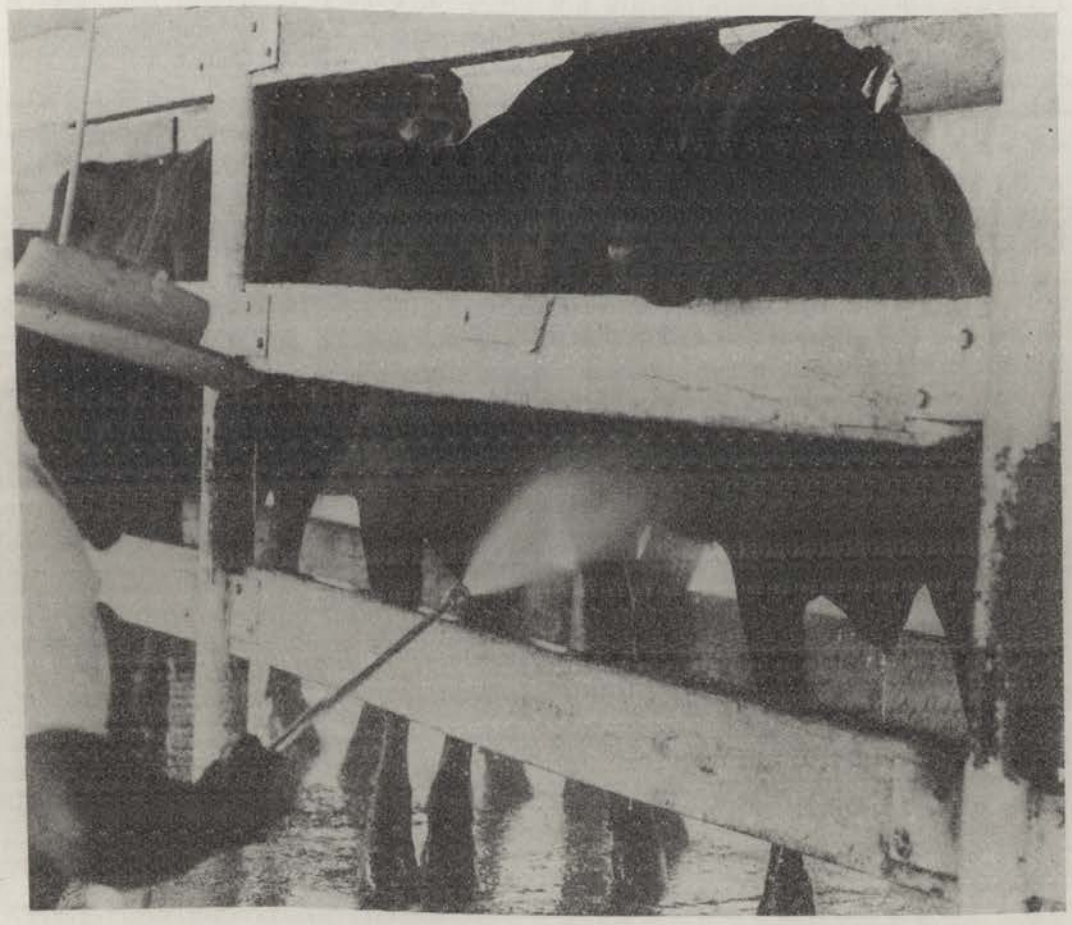

Plate II.—The cattle must get really wet all over.

adults, and fertilization of the females takes place. If this stage of the life cycle can be prevented, then obviously the ticks will die and there will be no eggs for the next generation.

Cattle tick can therefore be controlled by the spelling of tick-infected paddocks. If the cattle are moved to new paddocks after they have been sprayed (and the old paddocks are left vacant) the ticks in the old paddock will eventually all die. The length of time the paddock has to be spelled (or left empty) depends on the climate—in hot, dry conditions, the eggs on the ground hatch quite quickly and so the paddock does not have to be spelled for so long. To eradicate all the ticks in a paddock, it would have to be spelled for at least 12 months, but regular spelling for a few months each time will help to keep tick numbers down.

Responsibilities of Stock Owners

The *Animal Disease and Control Ordinance* (1952) provides for the control of cattle tick anl restricts its spread to tick-free areas. Stock owners should know what is in the ordinance.* If they do not they may help the spread of tick, tick fever or other diseases. They may also be fined for not obeying the ordinance.

All movements of stock are controlled by DASF Stock Inspectors. Permission to move stock must be obtained from a Stock Inspector before the stock are moved. Permission is usually granted after stock have been inspected and sprayed for tick and have also been cleared for various other diseases such as brucellosis, tuberculosis and anthrax.

* Copies of ordinances may be obtained from the Government Printer, Box 3280, Port Moresby. It is intended to publish in *Harvest* a series of articles on agricultural ordinances and their practical application for the primary producers.

Cattle tick is a notifiable pest under the *Animal Disease and Control Ordinance* (1952) and although cattle tick has been confined to the few areas mentioned earlier, anyone who suspects that cattle tick may be in the herd should notify DASF. As there are many different species of tick in Papua New Guinea, expert attention is needed for positive identification.

QUARANTINE RESTRICTIONS

In order to prevent the introduction of cattle tick from overseas various restrictions are placed on the importation of livestock and fodder originating from the tick areas of Australia or stock passing through these tick areas. Tick areas in Australia are northern New South Wales, Queensland, Northern Territory and Western Australia north of the Kimberleys. These stock must be sprayed four times at 5-day intervals with an approved insecticide on arrival in Papua New Guinea.

The ship should not have carried cattle from a tick-infested area during the 12 months prior to the loading of the stock. If this is unavoidable, the ship has to be treated with an approved insecticide to free it of any tick infestation.

Thanks to the co-operation of cattle owners, this pest has been confined to a few areas of Papua New Guinea, but there is no room for complacency, and owners must be continually aware of the possibility of tick infestation in their cattle.